Mario Holzner

Fear of Croatian Disease. Is there a danger of a Dutch Disease Effect with respect to a boom in the tourism sector in Croatia in the long run - 'The Croatian Disease'?

Thesis

Fear of Croatian Disease

Is there a danger of a Dutch Disease Effect with respect to a boom in the tourism sector in Croatia in the long run - 'The Croatian Disease'?

An Empirical Analysis

Vienna, 26th of October 2005

by Mario Holzner♠

Abstract

The aim of this research is to analyse empirically the danger of a Dutch Disease Effect with respect to a boom in the tourism sector in Croatia in the long run. Due to the brief time series of data available for Croatia, we employ for our econometric work data on more than 100 countries of the world over the period 1970-2000. In a first step the general, long-run relationship between tourism, growth, the real exchange rate, taxation and the manufacturing sector is looked at in a cross country setting. A panel data framework gives the possibility to counter check the acquired results. This second approach also allows to control for reverse causality, non-linearity and interactive effects, applying a more complex methodology. It is found that, at least in the long run, there is no danger of a Dutch Disease Effect with respect to a boom in the tourism sector – and thus, no fear of a 'Croatian Disease'! Countries with higher income from tourism tend not only to have higher economic growth rates but also higher levels of investment and secondary school enrolment. Countries dependent on tourism prove to be rather outward oriented, having low levels of real exchange rate distortion and its variability. Finally, tourism does not seem to lead to a contraction of the manufacturing sector.

Keywords: Tourism, Dutch Disease, Economic Development

JEL classification: F43, L83, O14

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Fear of Croatian Disease

Gibt es die Gefahr eines Dutch Disease Effektes hinsichtlich eines Booms des Tourismussektors in Kroatien in der langen Frist - 'The Croatian Disease'?

Eine empirische Analyse

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Abstract

Das Ziel dieser Arbeit ist es die Gefahr eines Dutch Disease Effektes hinsichtlich eines Booms des Tourismussektors in Kroatien in der langen Frist empirisch zu analysieren. Da die Zeitreihen kroatischer Daten zu kurz sind verwenden wir in unserer ökonometrischen Arbeit Daten von über 100 Ländern der Welt über die Periode von 1970-2000. In einem ersten Schritt ist die generelle, langfristige Beziehung zwischen Tourismus, Wachstum, dem realen Wechselkurs, der Besteuerung und der verarbeitenden Industrie in einer cross country Analyse untersucht worden. Eine panel data Analyse erlaubte die Überprüfung der zuvor erhaltenen Ergebnisse. Darüber hinaus erlaubt dieser zweite Ansatz mit Hilfe einer etwas komplexeren Methodologie die Kontrolle entgegengesetzter Kausalität, Nichtlinearität und interaktiver Effekte. Es stellt sich heraus, dass zumindest in der langen Frist, keine Gefahr eines Dutch Disease Effektes hinsichtlich eines Booms im Tourismus Sektor besteht. Daher braucht man sich vor einer 'Croatian Disease' nicht zu fürchten! Länder mit einem höheren Einkommen aus dem Tourismus neigen nicht nur zu höherem Wirtschaftswachstum, sondern haben auch ein höheres Niveau von Investitionen und sekundärer Schulausbildung. Tourismusabhängige Länder scheinen ein niedriges Niveau realer Wechselkursverzerrung und deren Variabilität zu haben und damit eher weltoffen eingestellt zu sein. Schlussendlich scheint der Tourismus nicht zu einem Schrumpfen der verarbeitenden Industrie zu führen.

Schlüsselwörter: Tourismus, Dutch Disease, Wirtschaftliche Entwicklung

JEL Klassifikation: F43, L83, O14

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1. Introduction

During the 1990s, Croatian economy experienced a process of deindustrialisation. This was due to the transformation process, the war and the loss of formerly important markets. The share of manufacturing in GDP declined from about 26% in 1990 to 18% in 2001. The share of employees in manufacturing in % of total employees in Croatia fell from 37% in 1990 to 23% in 2003.

Compared with other Central and Eastern European Countries (CEECs), Croatian gross industrial production reached only 75% of the 1990 level in 2003, while the CEEC-8[1] industrial production reached 140%. Moreover, employment levels in Croatian manufacturing are still falling, although the share of manufacturing employment in total employment is on average already smaller than in the other transition countries.

Croatia's external position is characterized by a huge and growing trade deficit: A slightly positive goods trade balance in 1992 shifted to an extremely negative position of around USD 8 billion in 2003. While goods exports have reached only some meagre USD 6 billion since 1992, imports tripled to USD 14 billion in 2003. Hence in 2003, Croatia was able to cover only roughly 40% of its imports by exports. Compared to the CEEC-8, Croatian exports are among the lowest and the trade deficit is the largest in the region. Relating the trade deficit to the GDP, Croatia is the leader in this statistic since 1995, with high double-digit shares. In 2003, it amounted to nearly 28% of GDP.

However, Croatian current account deficit reached about 7% of GDP in 2003. This is mainly due to the incomes from the growing tourism sector. The net incomes from travel services (Travel services balance) reached more than 20% of the GDP in 2003, with close to 6 bn USD. If employing a Tourism Satellite Account (TSA), that covers tourism in a much broader sense than the Balance of Payments (BoP)

[1] CEEC-8 include the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

statistics, thus including all tourist expenditures directly linked to tourism, these figures would be even much higher.

Compared to the other transition countries, Croatia's economic dependence on the tourism sector is unique. Second comes Bulgaria with 4.5% of net incomes from travel services in % of GDP in 2003.

Due to strong foreign exchange inflows in the tourism season, Croatian real exchange rate is under constant pressure to appreciate. Croatian real exchange rate is assumed to be highly overvalued since the introduction of the Croatian currency - Kuna. Moreover, from recent research on Croatian manufacturing exports (see Vuksic 2004) it becomes obvious that real exchange rate depreciation is a major factor in explaining Croatian manufacturing exports. Depending on the model estimated a 1% depreciation of the real exchange rate results in an increase of 1.2% to 2.5% of manufacturing exports.

All these single, short-run observations do not help to grasp the more general developmental issues which are at stake in a country like Croatia, which is dependent on tourism and faces a process of deindustrialisation. This is, firstly, because long time series for Croatian data do not exist and, secondly, because recent economic developments, such as the process of deindustrialisation, are influenced by several important determinants, which are as for instance the transformation process, the effects of the Balkan wars and possibly the tourism boom.

The aim of the following research is to shed light on the relationship of tourism, growth and manufacturing with regard to the long run. This could help to better understand the specific case of Croatia, to predict the long run developmental impact of the country's dependency on tourism and to find possible policy tools to foster economic growth of a tourism dependent country.

2. Tourism, Deindustrialisation and the Dutch Disease

2.1. Tourism

The development of the tourism[2] sector can cause various benefits and costs to an economy (see Sinclair 1998). On the one hand, tourism can contribute positively in many ways. Tourism can provide foreign currency earnings to finance imports of capital goods, necessary for the growth of the manufacturing sector. It increases the number of full-time and part-time jobs. Tourism can alleviate GDP and personal incomes. It also provides tax revenues for the government.

On the other hand, tourism expansion also involves considerable costs. This includes expenditure on the provision and maintenance of tourism specific infrastructure (e.g. additional roads, airports, water, sanitation and energy) as well as investment in tourism specific human capital. Foreign tourists' expenditures can alter domestic consumption patterns and can be inflationary. Land acquisition for tourism construction can have redistributional effects on domestic wealth and can exhaust the countries natural resource base. The instability of tourism earnings, due to relatively high elasticities of demand with respect to changes in inflation, exchange rates or political instability can cause falls in income, employment and investment. Moreover, a booming tourism sector could cause a process of deindustrialisation due to the Dutch Disease effect of booming export sectors.

2.2. Deindustrialisation

Deindustrialisation in the sense of a fall in the share of manufacturing industry in total employment *per se* is not necessarily something bad. Several ways of deindustrialisation can be distinguished (see Rowthorn and Wells 1987).

[2] For various economic aspects of tourism see Tisdell (2000). This book is an extensive compilation of pioneering work in the field of the economics of tourism.

There is a process of 'positive' deindustrialisation in highly developed economies as a result of sustained economic growth and full employment. This occurs because productivity growth in the manufacturing sector is so rapid that, despite increasing output, employment in this sector is reduced, either absolutely or as a share of total employment. Displaced workers are absorbed by the service sector.

On the contrary, 'negative' deindustrialisation occurs when manufacturing industry is in severe difficulties and the general performance of the economy is poor. Real incomes will stagnate and unemployment will rise, because labour shed from the manufacturing sector will not be absorbed from the service sector.

Finally, a third kind of deindustrialisation can be caused by changes in the structure of a country's foreign trade. A shift away from manufacturing exports towards exports of other goods or services will lead to a transfer of labour and resources from manufacturing to other sectors of the economy. This can also be the case of deindustrialisation due to the Dutch Disease effect of a booming export sector.

2.3. Dutch Disease

The Dutch Disease phenomenon describes the coexistence within the traded goods sector of booming and lagging sub-sectors. Traditionally, the booming sector is referred to be of an extractive kind (e.g. oil or gas) and the manufacturing sector is expected to be under deindustrialisation pressure. For the detailed description of the core model on a booming sector and deindustrialisation in a small open economy, including an algebraic formulation of the problem, see Corden and Neary (1982). For an extended and more general version of Dutch Disease economics, see Corden (1984).

In the core model, there are three sectors, the Booming Sector (B), the Lagging Sector (L) and the Non-Tradable Sector (N). B and L produce tradables facing given world prices. Production in all three sectors relies on a specific factor and on labour that is mobile between the sectors. Factor prices are flexible and all factors are internationally immobile. A boom in sector B initially raises aggregate incomes of the factors employed there. This causes two effects, a Spending and a Resource Movement Effect. The spending effect materialises as some part of the extra income in B is spent on nontradables and therefore increases the price of N relative to the price of tradables. This is known as real appreciation and it will draw resources out of B and L into N, as well as shifting demand away from N towards B and L. Additionally, the Resource Movement Effect gives rise to the marginal product of labour in B as a result of the boom so that, at a constant wage in terms of tradables, the demand for labour in B rises and induces a movement of labour from L and N into B. This effect can be divided into direct deindustrialisation as the movement of labour out of L into B lowers output in L and into indirect deindustrialisation generated by additional real appreciation through the movement of labour out of N into B, thus subsequently leading to an additional movement of labour from L to N, reinforcing the deindustrialisation resulting from the spending effect. Both effects lower the real rents of the specific factor in L and raise the wage W defined in terms of L, because both increase the demand for labour. It remains a question whether the real wage in terms of a consumption basket of tradables and N will rise or fall, depending on the developments of W and the relative price of nontradables.

The assumption of only one factor to be mobile between the sectors reflects rather the short run. However, Corden and Neary (1982) can also show in their models with mobile capital that an energy boom might cause deindustrialisation also over a somewhat longer time horizon. Moreover, Corden (1984) demonstrates in a variation of the core model with international capital mobility that deindustrialisation could be even bigger and even in the model including migration some deindustrialisation would remain.

The core model can be extended in many ways, e.g. by allowing for unemployment resulting from real wage resistance. The general principle is that if the boom would have reduced the real wage in the flexible price model, it would generate unemployment and vice versa. An interesting case can be considered, where some types of labour are specific to the Lagging Sector and practise real wage resistance at least in the medium run. It can be shown, that this would lead to an extra unemployment of such factors.

Furthermore, an extension of the model can include a move from static to dynamic analysis and can include an industry specific Learning by Doing induced technological progress, as it is a 'stylised fact' that technological progress is faster in the manufacturing sector than in the nontraded sector of an economy (see van Wijnbergen 1984). Thus, if most of economic growth is caused by Learning by Doing induced technological progress which moreover is largely confined to the traded goods sector, a temporary decline in that sector may permanently lower income per head in comparison with what could otherwise have been attained. It can be shown that countries consuming high but temporary oil revenues should increase subsidies to the non-oil traded goods sector as to preserve industry specific Learning by Doing effects in later periods.

This leads to the general question whether the Lagging Sector should be protected from Dutch Disease effects.

Corden (1984) offers three arguments for (and against) protection: The 'conservative social welfare function' argument; the employment argument; a version of the infant industry argument (similar to van Wijnbergen 1984). If protection is desired, subsidising the output of the Lagging Sector is argued to be the first-best method, perhaps by financing the subsidy from taxes levied on the specific factor in the Booming Sector. Avoiding real appreciation through exchange rate protection is considered by Corden to be the second best protection, because this would protect not only the Lagging Sector but also the Booming Sector. Ordinary tariff and quota protection is only partly effective and imposes the usual cost of protection.

Plein (2002) exhibits potentially positive externalities and economies of scale specific to the manufacturing sector as an economic motive for actions against the Dutch Disease Effect of deindustrialisation. Plein stresses 'Verdoorn's Law' according to which output growth and growth in productivity in the manufacturing sector are positively correlated. The 'Dual Economy' theory even extends 'Verdoorn's Law' by indicating the manufacturing sector as an 'engine of growth' for the whole economy by providing growth in productivity in all sectors through 'forward and backward linkages' of output growth in the manufacturing sector. He also emphasises the industry specific Learning by Doing effect as an argument to act against deindustrialisation. Moreover he underlines the temporary and volatile character of resource based earnings to have potentially distorting effects on the whole economy. Plein also discusses possible measures against the Dutch Disease Effect. These include inter alia long term structural and industry policy, subsidies, trade barriers, immigration, wage freeze, exchange rate depreciation and foreign asset policy.

Thus considering the above in the context of the proposed research it is important to reformulate the classical Dutch Disease Effect of a resource based export boom in the light of a tourism sector based boom.

2.4. Dutch Disease and Tourism

Copeland (1991) adjusted the Dutch Disease model of Corden and Neary (1982) and Corden (1984) in order to examine the economic effects of an increase in tourism in a small, open economy[3]. Adjustments are necessary because there are important differences between tourism and commodity exports. In the presence of tourism, goods that are normally non-tradable become partially tradable and tourists typically consume a bundle of goods and services jointly with unpriced natural amenities, such as climate and scenery. Thus, unlike in the Dutch Disease model, there is a direct increase in foreign demand for non-tradables in a tourist boom, the difference between a trade tax and a domestic commodity tax is fuzzy and unpriced natural amenities may generate rents.

Copeland shows that in the absence of taxation and distortions such as unemployment the appreciation of the real exchange rate is the only mechanism by which tourism can benefit the economy (if there were no nontradables, tourism would have no effect on domestic welfare). This would happen through a direct effect, which is the increase of the price of services, holding domestic spending constant, and an indirect spending effect, which is due to the change in domestic spending on services induced by the real income change. However, this could be only a small

[3] An underlying assumption of the model is a well-behaved constant returns to scale production function.

fraction of the potential gains, because this is a rather inefficient way of receiving rent from natural amenities. In the presence of international factor mobility the benefits of a tourism boom are even smaller as the price of non-tradables is less responsive to demand shocks. If fixed factors in the non-tradables sector, such as land, are foreign-owned, rents will leave the country and possibly even leave the country worse off than before the tourist boom. However it is important to note that the presence of domestic commodity taxes can increase the benefits of tourism, since they allow for some rents from the unpriced natural amenities.

With respect to the effects of a tourist boom on the pattern of production in other sectors and on factor returns it is hard to make clear predictions. Nevertheless, Copeland can show in a simple version of the specific factors model incorporating international capital mobility (labour is mobile across all sectors but is not mobile internationally) that tourism can lead to a contraction of the manufacturing sector (because of manufacturing capital leaving the country) and that even more than the entire aggregate social benefits of tourism (due to an increase in the price of services) are captured by the immobile factor specific to the non-tradables sector (i.e. a part of the land specific to tourism) if there is no taxation. If external economies are important to economic growth, then such a process of deindustrialisation may have welfare significance, if the potential external benefits generated by industrial expansion are bigger than those generated by an expansion of the tourism sector (the model of Nowak, Sahli and Sgro, 2003 comes to a similar conclusion[4]). Given that Copland's model incorporates capital mobility it could be argued that these results not only refer to the short run but also to the long run. This is even truer if the assumption about the industry specific Learning by Doing effect is valid.

These theoretical findings lead us to the general research question that can be posed as follows:

[4] In the model of Nowak, Sahli and Sgro (2003), under certain conditions, welfare and manufacturing output may fall as a result of increased tourism. This can occur when the non-traded tourism sector is more labour intensive than the agricultural traded sector. According to the authors, the empirical evidence on factor intensities suggests that this case is more likely to prevail and this theoretical possibility should therefore be taken seriously. With regard to the distortion literature they suggest that a tax-cum-subsidy policy is required to correct the distortion. Moreover they point out that due to the monopoly power in trade in tourism, the taxing opportunities are broader, for example, tourism tax receipts could be used to subsidize the manufacturing sector.

2.5. General Research Question

"Is there a danger of a Dutch Disease Effect with respect to a boom in the tourism sector in Croatia in the long run - 'The Croatian Disease'?"

3. Research Outline

In order to make some statements about the future development of the Croatian economy in the light of deindustrialisation and the tourism boom, we would like to rely on empirical research on international data.

The research shall consist of three major parts. The first of which shall provide case studies on the three possible determinants of deindustrialisation, considered important for the case of Croatia – Dutch Disease/Croatian Disease; transformation; Balkan wars. The case of Croatia shall be compared with the experience of other European countries which faced the above mentioned possible causes of deindustrialisation. This can be seen as a broader approach to form the framework of the main analysis that shall cover the specific topic of the long run relationship of tourism and economic development in general. This analysis will be conducted in the subsequent two parts, using econometric methods.

We shall employ in a first econometric approach a methodology similar to the one that Gylfason (2001) and others used in order to achieve empirical evidence from econometric studies of the cross country relationships between natural resource abundance[5] and economic growth[6] around the world. We shall modify this methodology for tourism sector dependence instead of natural resource abundance. Gylfason stressed the linkages between the natural resource abundance and various key determinants of economic growth as well as growth itself.

In general the results showed that natural resource based sectors as a rule are less high-skill labour intensive and perhaps also less high-quality capital intensive than other industries, and thus confer relatively few external benefits on other industries. This may help to explain why natural resource abundance tends to impede learning

[5] Gylfason (2001) used natural resource abundance, measured by the share of natural capital in total capital in 1994.
[6] In Gylfason (2001) the GNP per capita growth rate from 1965-1998 has been adjusted for initial income.

by doing, technological advance and economic growth. This linkage reinforces the case for investment in education and training as an engine of growth in the manufacturing sector. Besides the relationship between natural capital and economic growth, Gylfason also analysed the relationships between natural capital and trade openness, corruption, public expenditure on education, secondary-school enrolment and gross domestic investment.

Another, similar approach was made by Sachs and Warner (1995) and shall be incorporated and adapted for the use of the proposed research. Sachs and Warner (1995) employed cross country growth equations described in Barro and Sala-i-Martin (1995). The basic idea here is that economic growth[7] in economy i between time t=0 and t=T should be a negative function of initial income Y^i_0 and a vector of other structural characteristics of the economy Z^i:

$$(1/T)\log(Y^i_t/Y^i_0) = \delta_0 + \delta_1 \log(Y^i_0) + \delta' Z^i + \varepsilon^i \qquad (0.1)$$

Sachs and Warner (1995) tried to test whether measures of resource dependence[8] are among the Z's. They showed that economies with a high ratio of natural resource exports to GDP in the base year tended to have low growth rates during the subsequent period. The negative relationship holds true even after controlling for various variables found to be important for economic growth, such as e.g. trade policy, government efficiency and investment rates. Moreover Sachs and Warner found out that one of the most important indirect pathways connecting resource intensity and growth seems to be trade openness policy.

A paper in the tradition of the above studies was recently done by Papyrakis and Gerlagh (2003). They based their empirical work on the conditional convergence hypothesis as used e.g. by Sachs and Warner (1995), too. Again, in their cross country equations, economic growth[9] was dependent on initial per capita income, a natural resource abundance variable[10] and a vector of other explanatory variables.

[7] Sachs and Warner used the real per capita growth of GDP per annum of the period 1970-1989.
[8] Here, the preferred measure of resource dependence is the ratio of primary-product exports to GDP in 1971.
[9] Papyrakis and Gerlagh used the average annual growth of GDP per person between 1975 and 1996.
[10] Here, the share of mineral production in GDP for the 1970-1989 period was used as a proxy.

However, Papyrakis and Gerlagh tried to focus on the transmission channels through which natural resource abundance negatively affects growth. In their paper this is the effect of natural resources on corruption, investment, trade, schooling, and then indirectly, on economic growth.

Their finding is that natural resources have a negative impact on growth when considered in isolation, but a positive when including the other variables in the analysis as independent. However, when considering the indirect effects of natural resources on growth via the possible transmission channels, a strong negative effect can be found. Papyrakis and Gerlagh (2003) also calculated the relative importance of each transmission channel. The most important channel was found to be corresponding to the investment variable. It accounted for almost half of the negative impact of natural resources on growth.

Here, we shall also make use of some of the theoretical findings in the literature on tourism and the Dutch Disease and try to estimate the relationship between tourism sector dependence and other key variables like e.g.: trade patterns and real exchange rate developments. This could help to find out more about potential indirect transmission channels.

Thus, in order to find out more about the general, long term relationship between tourism, growth and manufacturing, we shall employ in a first approach a cross country analysis framework as described in the empirical literature of the Dutch Disease (see above). A second approach, using a panel data framework would allow for a recheck of the results and an analysis of the problem across countries as well as across time. This will constitute the third part of our research.

A summary of research outcomes relevant for the Croatian economy shall conclude the work. Here, we shall also use the findings in the preceding steps in order to be able to make some statements about the future development of the Croatian economy in the light of deindustrialisation and the tourism boom and about possible economic policies for a favourable economic development in Croatia.

4. Deindustrialisation Case Studies

The case of Croatian deindustrialisation, which might have a negative long run impact on economic development due to the commonly assumed positive externalities of the manufacturing sector, has certainly several causes. Figure 4.1 (find this and other figures and tables in the appendix) shows a Venn-diagram of three possible causes of deindustrialisation which seem to overlap in the case of Croatia. A Dutch Disease with regard to a boom in the tourism sector is just one of those possible causes. The other two being the transformation process of post socialist countries and the wars which occurred in the Balkans in the 1990’s.

The following three subchapters will deal with the three possible causes for deindustrialisation separately by showing case studies of European countries which faced similar shocks. The last subchapter will have a close look at the recent developments in the Croatian economy, providing a kind of a synthesis of the three observed phenomena.

4.1. Dutch Disease

We shall start off with the original case of a Dutch Disease due to an export boom in the natural resources sector, which occurred in the Netherlands. Later on we shall have a look at some Mediterranean countries and their economic development in the light of high tourism revenues.

In 1959 large natural gas reserves were found in the North Sea belonging to the Netherlands. By 1976 these reserves earned revenues of about USD 2 bn and saved an estimated USD 3.5 bn in imports. However, between the beginning of the decade and the mid 1970s gross corporate investment had fallen by 15%, employment in manufacturing had declined by 16% and unemployment had risen from 1.1% to 5.1%. (see O’Toole 1998)

Figure 4.2 provides us with key indicators of the Dutch economic development over the period of 1960-2001. We observe manufacture as a percentage of total merchandise exports, the real GDP index with 1960 having the value of 20 and the commercial energy production in 1000 kt of oil equivalents. All the data was taken from the World Development Indicators 2003 (World Bank 2003) and reveal the period of 1960-2001. What can be seen with the naked eye is that from 1967 until 1976 energy production has increased dramatically in the Netherlands. After that production declined to a certain extent but remained on a rather high level. Between 1974 and 1983 several years of economic decline can be observed. The share of manufactures exports had a peak in 1969 with a 58% in total merchandise exports. This share was only reached again in 1987. Unfortunately we do not have another aggregate indicator for the manufacturing sector in the Netherlands for such a long time period.

Thus in addition, in the figures 4.3 to 4.5 we examine the percentage change of the production indices of the Dutch metal-electro, chemical-linked and paper, printing and publishing industries over the period of 1951-2001, respectively (data taken from Noordman, Verbruggen and Minne 2003). The figures include a polynomial trend line in order to better grasp the development of these industries which display a fairly volatile development. All the three industries show a considerable growth slowdown since the mid 1960s.

Overall, the data suggests at the first sight that the tremendous increase of energy production in the Netherlands did not necessarily support the manufacturing sector and economic growth. Rather the contrary might be true. However, we shall check this with the help of a few simple Ordinary Least Squares (OLS) regressions[11] in order to find out whether these observations are statistically significant.

Table 4.1 presents the results of several time series estimates explaining five different dependent variables. In estimate NL1 we have regressed the share of manufacture exports in total merchandise exports nlmx on the energy production variable nlep (a description of all the variables used in this and other tables can be

[11] All the regressions in this chapter were estimated with the help of Intercooled Stata 8.0 for Windows software.

found in the appendix) over the period 1962-2000. The outcome is insignificant. The model's goodness of fit, as displayed by its R^2, is zero. None of the variance of the dependent variable can be explained by the model. Thus we can't make any statement on the relationship of the manufactures share of exports in total merchandise exports and the energy production.

However, using in estimate NL2 the energy production figures to explain real GDP growth nlyg between 1962-2000 yields a highly significant result. The estimated coefficient of the energy production variable is negative and significant at the 1% level. The R^2 is close to 40%. Thus an increase in energy production was accompanied by a decline in the growth rate of real GDP in the Netherlands. It has to be mentioned that this does not indicate any causal relationship. There might be dozens of other reasons why there has been a growth slowdown in the 1970s and 1980s in the Netherlands. However, in this section we do not want to use too sophisticated estimation methods as these results shall have only an indicative character. Similarly we also do not want to test the underlying assumptions of these simple regressions.

Given the disappointing insignificancy of the first estimate on the only available aggregate manufacturing figure for this long time period we shall use the three available manufacturing production growth figures for the metal-electro (nlme), the chemical-linked (nlch) and the paper, printing and publishing (nlpp) industries as proxies for the overall Dutch manufacturing production in the observed period. Regressions NL3 to NL5 explain the above mentioned production growth figures of the three industries separately by both the energy production figure as well as the real GDP growth figure for the period of 1961-2000. We included the GDP growth variable in order to filter the assumed strong impact of the aggregate demand on manufacturing output. Consequently, the estimated coefficient of the nlyg figure is positive and significant at the 1% level. The result for the explanatory variable of energy production is somewhat more ambiguous. Though the estimated coefficient is negative in all the three cases, the level of significance reached is only 20% for the metal-electro and the paper, printing and publishing industry and 10% for the chemical-linked industry case. The R^2's range from about 40% to 60%. Thus it can be said that these results only gently tend to support the Dutch Disease theory.

From the above used data it is difficult to make a clear judgement on the empirical validity of the Dutch Disease effect in the specific case of the Netherlands. A host of empirical literature tried to find out whether the Dutch Disease was Dutch after all. Hutchison (1994) used quite sophisticated econometric methods to analyse the manufacturing sector resiliency to energy booms in Norway, the Netherlands and the United Kingdom. The results for the Netherlands suggest that only very little systematic and long-term net adverse consequences of natural gas development on the manufacturing sector were found. In general, the view that national deindustrialisation is the inevitable outcome of an energy boom is not provided much support.

Let us now turn to the cases of two countries which might have experienced a 'Croatian Disease' due to strong revenues from the tourism sector – Greece and Spain.

In Figure 4.6 we gathered data on economic growth, travel services exports and industrial value added as shares in GDP over the period of 1976-2001. The data was taken from the World Development Indicators 2003. Unfortunately the travel data does not date back longer. In fact Greek tourism revenues in GDP remained fairly stable between 3%-4% over most of the period observed. Only from 1998 on this share increased significantly above 5% of GDP. Over the whole period industrial value added constantly declined from a level of about 35% to only some 20% of GDP. Economic growth was rather anaemic over most of the period analysed. Between 1980 and 1993 many years of stagnating or even falling real GDP can be observed. It is only in the second half of the 1990's that growth picked up.

The present figure almost suggests that falling shares of manufacturing and increasing shares of tourism lead to an increase of real GDP growth. Nevertheless a quick and undemanding time series regression on this issue using the data at hand does not yield any significant result. Estimation EL1 in table 4.2 fails to explain real GDP growth (elyg) by the shares of industry (eliv) and travel services exports (eltx) in GDP respectively. Interestingly enough, when trying to explain the share of industrial value added in GDP by the share of tourism revenues in GDP and the GDP growth rate (used as a proxy for the aggregate demand development), the tourism variable's estimated coefficient is negative and significant at the 5% level (see estimation EL2). Though the growth coefficient is not significant the model explains about a quarter of the variance of the dependent variable. Thus, bearing in mind that these are not at all fully fledged econometric models to explain the respective dependent variables, at least some evidence suggests that higher tourism revenues go together with deindustrialisation in Greece. However, this does not necessarily transform into lower GDP growth rates.

As a matter of fact a recent article on manufacturing and competitiveness in Greece (see Pitelis and Antonikakis 2003) reveals a positive relationship of real GPD per capita and an increase in the share of manufacturing output in GDP and the decrease of the share of services output in GDP. Also the share of manufacturing output in GDP is negatively related to the level of agricultural and services output in GDP. However, besides that slightly different input data (e.g. manufacturing output versus manufacturing value added) was used for this econometric analysis it is also worthwhile to mention that the data comprises the years from 1963 to 1994 only. Especially with regard to the former result this is somewhat odd as the analysis leaves out the whole second half of the 1990's where GDP increase was stronger than before and the share of manufacturing value added in GDP decreased further. It might be assumed that an inclusion of more recent data would have turned the growth equation insignificant as it was the case in our estimation EL1. Nevertheless, the negative relationship between tourism and industry from our estimation EL2 seems to be confirmed by this paper.

From figure 4.7 it appears that the case of Spain is not that different. Between 1975 and 2001 tourism revenues were ranging from about 3%-5% of GDP with peak values in the second half of the 1980's and 1990's. Interestingly enough these are also the periods with strongest real GDP growth. The share of industrial value added in GDP declined throughout the whole period from more than 40% to some 30% of GDP. Again, the data was taken from the World Development Indicators 2003.

Using again our two simple OLS time series regression models as in the case of Greece yields the following results. Model ES1 in table 4.3 which tries to explain growth by proxy variables for tourism and industry exhibits a positive and significant (at the 5% significance level) result for the estimated tourism coefficient while the industry coefficient remains insignificant. This seems to correspond to our naked-eye observation of the data. This result is however somewhat different to the case of Greece where none of the two estimated coefficients were significant.

In the second estimation ES2 the share of industrial value added in GDP was explained by travel services exports in GDP and the GDP growth rate. Here the result is similar to what was to be found in the Greek case, just that the level of significance is higher and the goodness of fit is better. The estimated tourism coefficient is negative and significant at the 1% level. The R^2 marks 54%. Thus the model explains more than half of the variation of the dependent variable.

Apparently our results are confirmed by a detailed study done on the economic effects of tourism in Spain (see Blake 2000). The study uses a Computable General Equilibrium (CGE) framework. The results indicate that an increase in tourism revenues yields a small but positive increase in overall welfare (around one-tenth the increase in tourist expenditures). Moreover increased tourism expenditure leads to adjustments through a real exchange rate appreciation that reduces exports from other exporting sectors and increases imports. Consequently the sectors which are loosing output in the wake of a 10% increase in tourism demand are the sector of agriculture and other primary products and the manufacturing sector other than food beverages and tobacco.

Here we can conclude that there are certainly many reasons for the observed deindustrialisation process in both of the analysed Mediterranean countries, tourism might have its influence too. However this does not necessarily mean that as a consequence economic growth is negatively affected. Yet, this remains to be analysed in the following two chapters. The next two subchapters are dealing with the other two possible causes for deindustrialisation as described in the Venn-diagram above.

4.2. Transformation

Another cause of deindustrialisation in Croatia was due to the transformation process. As a matter of fact all the post-socialist countries experienced a decrease of production, employment and consumption at the very beginning of the transformation process. This is due to the shift from a supply market and the new demand constraint, which should yield in the long run higher efficiency (see Laski 1992). Transition countries had to apply several steps of economic transformation on their way to a market economy, which had its short run adverse economic implications. These steps can be summarised in the following four categories: stabilisation, liberalisation, privatisation and restructuring, institution building. See Hoen (1998) on more on this.

As an example the case of the Czech Republic during the transition process can be examined. Figure 4.8 shows the development of real GDP and industrial production as well as two transformation indicators, the share of administered prices in the Consumer Price Index (CPI) and the share of bad loans (i.e. non-performing loans) in percent of total loans. The data on the former two indicators stems from the wiiw database of the Vienna Institute for International Economic Studies (wiiw 2004), while the data on the latter two originates from the European Bank for Reconstruction and Development (EBRD 2000, 2004).

The graph reveals a considerable dip of both GDP and industrial production at the beginning of the transformation process in the early 1990's. The fall in industrial production was even much stronger and lasted longer than the overall GDP decrease. As already indicated above, this is very much related to the initial price liberalisation. The share of administered prices in the CPI can be seen as an indicator of the price liberalisation. The fall of the share of administered prices was the strongest in the first years of transition.

However, after some economic recovery the Czech Republic experienced a second growth dip in the second half of the 1990's. This loss in both GDP and industrial production was due to a banking crisis, which was caused by unresolved restructuring in the banking sector and rather high shares of bad loans in the economy. Subsequent current account and currency crisis and government austerity packages in 1997 have caused a recession. In fact several transition countries experienced such a second transition shock in the wake of a banking crisis.

Nonetheless, the Czech GDP recovered and reached in 2000 for the first time the 1990 level. Also from 2000 onwards a process of reindustrialisation can be observed, with the industrial production reaching in 2003 the 1990 level.

Nevertheless, it should not be forgotten that Croatia did not experience a strictly planned economic past in its socialist pre-transition times, which by contrast the Czech Republic did. The former Socialist Federal Republic of Yugoslavia (SFRJ) of which the Socialist Republic of Croatia was a federal unit performed its own economic model in opposition to liberal capitalism as well as central planning. The Yugoslav economic system was to combine markets with 'social ownership' (i.e. workers' self government). Workers' self government should have had united the advantages of decentralised economic decision making with those of the collective. In fact the Yugoslav economic system remained a mixture of free markets, suppressed markets and missing markets, respectively of free prices, multiple and black market prices. Moreover, workers' self government imposed strong incentives for wage maximisation which had its negative impact on employment, investment and inflation. The SFRJ was probably the only socialist country with a high official unemployment rate. For more on this see Gligorov (1998) and Holzner (2000).

Thus it makes sense to use for comparative reasons the case of Slovenia as a benchmark for Croatia and an example for transition in a post Yugoslav setting. Figure 4.9 displays the main indicators for Slovenia in this respect. Both, the data on real GDP development and the gross industrial production were again taken from the wiiw database. The chosen transition indictor of the private sector share in GDP stems from the EBRD. The latter indicator shows the constant increase of the estimated private economic activity in Slovenia with its steepest increases in the first half of the 1990's.

Similar to the other transition countries Slovenia experienced a decline of economic growth and industrial production in the first years after the dissolution of Yugoslavia and the beginning of transformation. However, from 1993 onward the Slovenian economy grew constantly at a rate of around 4%. This allowed the GDP to reach its 1990 level already in 1996. The industrial production was less dynamic and did not even in 2003 reach its 1990 level. Thus in Slovenia we observe a constant process of deindustrialisation over the whole transition period. It is therefore indicative that the Slovenian manufacturing value added in GDP declined from about 30% in 1990 to a level of 24% in 2003. At the same time the Czech Republic was able to maintain a share of manufacturing value added in GDP of roughly 24% throughout the whole transition period.

4.3. Balkan Wars

War is a pretty straight forward reason for deindustrialisation. During the Balkan wars countries experienced direct and indirect destructions of their industrial base. Besides extermination of human and physical capital through shelling or bombing, the hostilities brought economic embargos, the loss of former markets and the redirection of investments for martial purposes. Serbia and Montenegro, the country that was responsible for all the wars on the territory of the former Yugoslavia, did experience all those direct and indirect war effects and shall be therefore analysed in the following.

In Figure 4.10 the development of real GDP and industrial production in Serbia and Montenegro over the period of 1990-2003 is displayed. The data was taken from the wiiw database. Moreover it is indicated in which years Serbia and Montenegro was involved in warfare against its neighbours – Croatia 1991-1992, Bosnia-Herzegovina 1992-1995 and Kosovo 1999. Was it only indirect war effects that Serbia and Montenegro was affected from 1991-1995, the 1999 NATO bombardment in the wake of the Kosovo war affected the country also directly.

Overall GDP as well as the industrial production experienced an enormous decline in the first half of the 1990's to a level below half of what it was at the beginning of the decade. While in 1998 both indicators increased above half of the 1990 level, the Kosovo war in 1999 made them drop again below. In the following years the industrial production did not cross that low level anymore. Serbia and Montenegro is an impressive example of war affected deindustrialisation due to a decade of conflict.

4.4. The Case of Croatia

In the case of Croatia all the three above described possible causes of deindustrialisation occurred simultaneously since 1990. Croatia experienced a transformation process, was attacked by Serbia from 1991-1992, re-conquered the occupied territories in 1995, had a banking crisis in 1998 and last but not least – experienced a tourism boom.

Figure 4.11 presents the development of real GDP and industrial production in the period of 1990-2003 as well as travel services exports in % of GDP for the period of 1993-2003. This data stems from the wiiw database. Moreover the figure shows the share of bad loans in % of total loans from 1994-2003 as provided by the EBRD. Finally it is indicated at which points in time Croatia was at war.

The economic downswing in the first years of transformation and in the war period was substantial. However, deindustrialisation was even stronger. While GDP started to recover since 1994 it took three more years for gross industrial production to manage the turnaround. The 1998 banking crisis together with the 1999 Russia crisis triggered a recession in 1999 when both GDP as well as industrial production fell. The accumulated share of non-performing loans in total loans was considerable. At the same time tourism revenues started to increase dramatically.

Since 1995, the year of the last military operations in Croatia, the share of travel services exports in GDP increased from a level of about 7% to as much as 22% in 2003. While GDP almost reached the 1990 level in 2003, the industrial production made only about 75% of the pre war level in 2003. Manufacturing value added as a share of GDP further decreased from a level of 19.5% in 1995 to 17.5% in 2001.

In this respect it is interesting to have a look at the development of the real and nominal exchange rate as the Dutch Disease/Croatian Disease effect works via an appreciation of the real exchange rate. Figure 4.12 shows the monthly data of the real effective exchange rate index (dotted line) and the nominal exchange rate index (full line) of the Croatian kuna against the euro from January 1996 to April 2005 as provided by the Croatian National Bank. The monthly indices are standardised to the average of the year 2001 being 100. The real effective exchange rate index is a weighted geometric average of the index of bilateral exchange rates of the kuna adjusted for the relative consumer price indices. Decreasing trends indicate an appreciation and increasing trends a depreciation of the exchange rate.

As can be seen from the figure the real effective exchange rate (REER) remained within a band between 95% and 100% of the 2001 level in the years 1996 and 1997. In the wake of the banking crisis in 1998 and 1999 the nominal exchange rate of the kuna was devalued and subsequently the REER depreciated to a level of close to 105% of the 2001 average by May 2000. Since then the nominal exchange rate against the euro remained on average stable at 100% of the 2001 level with appreciation pressure in the summer months (see downward peeks from June until September) when tourists exchange huge amounts of foreign currency. As a consequence, given that the inflation is higher in Croatia as compared with its main trading partners (i.e. the euro-zone countries), the REER appreciated heavily to a level below 90% of the 2001 average at the beginning of 2005. In the period since the year 2000 Croatian tourism revenues increased strongly above a level of as much as 15% of GDP.

However, given the simultaneity of all the possible causes of deindustrialisation in Croatia it is rather difficult to asses the specific case of a deindustrialisation due to strong tourism revenues. Moreover, war and transformation could be considered as transitory events, while the Croatian tourism sector might remain important in the long run. Therefore we shall rely in the following two chapters on econometric analysis of the long run effects of a big tourism sector using data for all the countries in the world over the period of 1970-2000. This shall help to assess the case of Croatia as a tourism dependent country in the long run.

5. Cross Country Analysis

This section will try to provide first insights into the long run relationship of tourism, growth, real exchange rate, taxes on goods and services and manufacturing from a cross country analysis perspective.

Therefore we will define the following sub-questions to the general research question in line with the model by Copeland (1991). First, do countries with a high degree of tourism dependency experience lower growth; Second, what are the indirect effects of tourism dependency via important growth factors; Third, is the appreciation of the real exchange rate a mechanism by which tourism can benefit the economy; Forth, can the presence of domestic commodity taxes increase the benefits of tourism; Fifth, does tourism lead to a contraction of the manufacturing sector?

5.1. Tourism and Economic Growth

The existing empirical literature on tourism and economic growth so far has mainly focused on case studies of single countries or certain country groups. An important string of research in this respect is the work done on tourism and economic growth of small countries (see e.g. Lanza and Pigliaru 1994, Modeste 1995, Candela and Cellini 1997, Lanza and Pigliaru 1999, Brau, Lanza and Pigliaru 2003). It is observed that microstates[12] specialising in tourism grow faster. However, in our research we want to tackle the wider topic of tourism and economic growth from a cross country analysis perspective.

[12] Brau, Lanza and Pigliaru (2003) are following Easterly and Kraay (2000) when defining small countries as countries with an average population of less than one million.

For the purpose of our research the first cross country analysis is based on a growth model similar to the Solow growth model with Cobb-Douglas[13] production including human capital (see Romer 1996). In this framework output is characterised as follows:

$$Y = K^{\alpha} H^{\beta} [AL]^{1-\alpha-\beta}, \quad \alpha>0, \beta>0, \alpha+\beta< 1, \tag{1.1}$$

where Y denotes output, K physical capital, H human capital, A the effectiveness of labour and L labour. Defining k = K/AL, h = H/AL, and y = Y/AL, and using equation (1.1) yields:

$$y = k^{\alpha} h^{\beta}. \tag{1.2}$$

Taking logs of equation (1.2) results in:

$$\ln y = \alpha \ln k + \beta \ln h. \tag{1.3}$$

However, considering the dynamics of output under the conditional convergence theory and the needs for the empirical application of the researched relationship in a cross country analysis setting based on the standard literature by Barro (1991), Levine and Renelt (1992), Barro and Sala-i-Martin (1995) and Sachs and Warner (1995) leads to the following equation:

$$y_T/y_0 = F[y_0, k, h], \tag{1.4}$$

where the growth of output per effective labour unit y_T/y_0 is a function F of the initial output per effective labour unit y_0, k and h. Using the interpretation of Mo (2001),

[13] The author would like to note that he does not necessarily believe the aggregate Cobb-Douglas production function to be an especially good model for explaining economic output and growth. On the contrary, growth models in the tradition of Keynes (1936), Harrod (1939), Domar (1946) and Kaldor (1961) might be explaining reality much better. For a critical discussion of the aggregate neoclassical production function in general and the Cobb-Douglas production function in particular see e.g. Zambelli (2004) and Shaikh (1974) respectively. However, its practical applicability for econometrics has made the Cobb-Douglas production function a conventional starting point of growth analysis. Allegedly, in 1927 Paul Douglas asked a professor of mathematics, Charles Cobb, to devise a formula that could be used to measure the comparative effect of each of two factors of production upon the total product to satisfy a linear log-log relationship in his input and output data (see Douglas, 1967).

which is based on Schumpeter (1912, 1939), the described relationship reflects two main classes of influence on the evolution of an economy in the long run. One is the growth component, which is due to changes in the factor availability of capital and labour (i.e. variables K and AL). The other is the development component of social and technological changes driving total factor productivity (i.e. variables Y_0 and H)[14].

As this research aims at analysing the relationship between tourism and growth, the basic growth function as described in equation (1.4) shall be augmented by the variable t, which should be an indicator of the tourism dependency of a country[15]. This yields the following equation:

$$y_T/y_0 = F[y_0, k, h, t]. \qquad (1.5)$$

Using (1.5), a testable equation in logarithmic form can be defined as:

$$\ln(y_T/y_0) = \alpha \ln y_0 + \beta \ln k + \gamma \ln h + \delta \ln t. \qquad (1.6)$$

The estimated cross-country regression[16] equation is the following:

$$\mathrm{lnG7000/30}_i = a + b_1 \mathrm{*lnY70}_i + b_2 \mathrm{*lnI7000}_i + b_3 \mathrm{*lnS7000}_i + b_4 \mathrm{*lnT7000}_i. \qquad (1.7)$$

The variable lnG7000/30 is the average annual growth of the natural logs of real GDP per capita between the years 1970 and 2000. This variable is used as a proxy of the growth of y. lnY70 is the natural log of real GDP per capita in the initial year 1970. lnI7000 is the natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. This variable is the proxy variable for k. lnS7000 is the natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The variable lnS7000 can be used as a proxy for h.

[14] The reason why, beside the human capital stock H, the initial output level Y_0 is also defined as a development component is that under the conditional convergence theory initially poorer countries have the possibility to grow faster as they can learn, imitate and apply technological achievements of the leading countries in a relatively short period of time.
[15] In theory, one could also think of t being a third type of a capital variable beside the physical and human capital variables, indicating tourism specific capital such as natural amenities, historical sites, *etc*.
[16] All the cross country regressions in this chapter were estimated with the help of Microsoft Office XP Professional Excel 2002 software.

lnT7000 is the natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The variable can be used as a proxy for tourism dependency. An exact description and the sources of the variables as well as the tables with the regression results can be found in the appendices.

Table 5.1 shows the results of the stepwise application of the cross-country regression equation (1.7). After adding all the relevant variables, the estimation A4 column shows the coefficients of the variables in the equation as well as their significance for a sample of 96 countries around the world. Croatia is not included in the sample as relevant data for this country exists only since the 1990s. This sample has been chosen out of a data pool of 208 countries and territories of the world on the basis of data availability of all five employed variables. In order not to diminish the sample further, those three variables that were calculated as averages (lnI7000, lnS7000, lnT7000) do not necessarily represent an average of the whole period of 31 years. Rather, they represent an average of years due to data availability. Here, the average investment data has the highest quality with a mean of 31 observations used for calculating the variable lnI7000 per country[17], then comes the human capital variable with a mean of 24 and the tourism variable with a mean of 23 observations per country.

In the estimation A4 all the classical economic growth variable coefficients have the expected sign and are highly significant. The estimated coefficient of the initial GDP per capita level has a negative sign, as rich countries tend to grow at a lower pace than poorer countries (given their investment in physical and human capital) in line with the conditional convergence theory. The estimated coefficients of physical and human capital have both positive signs, confirming their importance in explaining growth in the long run. All three traditional growth factors' estimated coefficients are highly significant at the one percentage level.

With regard to the estimated coefficient of the tourism dependency variable lnT7000, the result is significant at the five percentage level and the sign of the coefficient is positive. This implies the following interpretation of the result. A one percent increase

[17] In this case, only one country had 30 observations.

of the share of tourism revenues in GDP increases (ceteris paribus) the growth rate of real GDP per capita by about one quarter of a percent after controlling for initial GDP per capita as well as physical and human capital. Figure 5.1 shows the scatter plot of the relationship of tourism and growth including the (partial) regression line.

The goodness of fit of the model with regard to the data is relatively high. Half of the variance of the dependent variable can be explained by the model. Thus, the model has an R^2 of about 50%.

In the following the model shall be tested with regard to the underlying assumptions of the regression analysis. Table 5.2 shows the results of the testing for the normal distribution of the residuals in A4. The 0-hypothesis (normal distribution of the residuals) has to be rejected as the Jarque-Bera Test reveals a relatively high number and the P-value is close to 0. This implies that the estimated values are undistorted and consistent but not efficient, which means that there exist other functions for estimating with a higher precision. This also implies that the t-statistics for the calculation of the significance are not any more adequate.

However, according to Geyer (2002) this is only relevant for small samples and in those cases where the deviation of the normal distribution is extremely high. This does not seem to be the case in this regression, however, due to the result of the Jarque-Bera Test it makes even more sense to use another estimation method (e.g. a panel data model) in addition for rechecking the results gained in the cross country setting.

Another test is the test for heteroskedasticity, which looks for a potential distortion of the standard errors in the case when the variance of the residuals is not constant. Table 5.3 shows the results of the White Test for heteroskedasticity. For this test the squared residuals of A4 were regressed on the explanatory variables of A4 and their squares. In this case the 0-hypothesis of homoskedasticity cannot be rejected, thus the standard errors of the coefficients are not distorted.

Table 5.4 presents the matrix of correlation coefficients of the independent variables of estimation A4 which can be used as a test for multicollinearity, which exists if there is correlation between the explanatory variables. However, none of the variables are highly correlated (e.g. with a correlation coefficient above 0.9). Thus multcollinearity can be ruled out.

5.2. Indirect Effects of Tourism

Estimating the indirect effects of tourism dependency via the two important growth factors – physical and human capital - leads to the results presented in table 5.5. Without claiming to estimate a fully fledged model explaining investment (lnI7000) or secondary school enrolment (lnS7000), both variables were explained by the tourism dependency variable solely.

The sample for the estimations B1 and B2 were the same 96 countries as in the set of regressions A1 to A4. In both cases the estimated coefficient of the tourism dependency variable lnT7000 is positive and significant (at the 5 percent and at the 1 percent significance level, respectively). The goodness of fit of both models with regard to the data is modest. Less than 5% and 12% of the variance of the dependent variable can be explained by the model, respectively. Figures 5.2 and 5.3 show the scatter plot and the regression line of the relationships between tourism, physical and human capital as described in B1 and B2 respectively.

The implication is that countries with higher income from tourism rather tend to have also higher levels of investment and secondary school enrolment. This could be explained by the necessities of tourism specific investment in physical and human capital as for example in transport infrastructure and the acquisition of languages.

5.3. Tourism and the Real Exchange Rate

With respect to the mechanisms by which tourism could benefit the economy in the model developed by Copeland (1991) the appreciation of the real exchange rate shall be analysed first. For this reason, the standard growth model including initial real

GDP per capita, investment and secondary school enrolment is augmented by a measure for the real exchange rate - lnRPL7000. This variable is the natural log of the relative price level (RPL) index, averaged over the period of 1970 to 2000. Based on the methodology of Dollar (1992), RPL was calculated by dividing each country's price level of consumption in 1996 international USD, taken from the Penn World Table Version 6.1 (see Heston, Summers, Aten 2002), by the price level of consumption of the United States of America as the benchmark country. The same set of 96 countries as used in the previous regressions was used here too.

However, as can be seen from table 5.6 column C1, a relatively high domestic price level does not affect economic growth at all, given the three classical growth explaining variables. The estimated coefficient of the RPL variable is very low and completely insignificant. Moreover, regression C2 shows that tourism does not explain the relative price level of a country. According to Balassa (1964) the price level of non-tradables can be explained by the level of development in a country. More developed countries should have a higher price level of non-tradables because the productivity advantages of more developed countries tend to be greater in traded goods industries. As can be seen from regression C3 (and figure 5.4) this holds true for our dataset. Here RPL was explained by the level of initial 1970 GDP per capita at PPP. The coefficient of lnY70 is positive and highly significant. The R^2 is as high as 41%.

Following the methodology of Dollar (1992) an effort can be made in order to detect the Real Exchange Rate Distortion index (RERD). RERD is calculated by dividing the actual price level RPL by the predicted price level (PPL). This provides a measure of the extent to which the real exchange rate is distorted away from a hypothetical free-trade level. Thus, this measure is in a more general sense a measure for outward orientation, including the effects of exchange rate as well as trade policy[18]. Estimating the PPL is based on the assumption that there is a systematic relationship between the per capita GDP and the price level. The applied regression[19] equation is

[18] In this respect e.g. high tariff protection has to be seen as a potential source of real exchange rate distortion.
[19] This pooled, cross-section regression was estimated with the help of SPSS for Windows 10.0 software.

$$RPL_{it} = a + b_1*rgdpl_{it} + b_2*rgdpl^2_{it} + c_t d_t, \quad (1.8)$$

where the rgdpl variables for the respective countries and years represent real GDP per capita in 1996 international dollars, again taken from the Penn World Table Version 6.1 (see Heston, Summers, Aten 2002), and where the d_t's are the year dummies for each year other than 1970. The quadratic rgdpl² variable was used in order to check for the possibility of nonlinearities. Thus obtaining from the regression results the PPL for each country and each year allows calculating RERD by dividing the actual price level RPL by the predicted price level PPL.

Introducing the RERD variable into the basic growth regression (see estimation C4 in table 5.6) yields a negative coefficient significant at the 5% level. This implies that a distorted real exchange rate and inward orientation is negatively related with economic growth in the long run. Checking for the relationship of tourism and the distortion of the real exchange rate in the estimation C5 proves a significantly negative coefficient for the tourism dependency variable. The R^2 though is not very high (7%). Figure 5.5 presents the relationship graphically. This could be interpreted in the way that countries with high incomes from tourism tend to be in general more outward oriented. Tourism might require a lot of imports of final goods, e.g. to which the tourists are used to from their countries of origin. This in turn would strengthen import lobbies and the advocates of trade liberalisation. Moreover, depreciation can stimulate a country's tourism industry by increasing its competitiveness (see also Sahli, Hazari and Sgro, 2003).

Additionally, the Real Exchange Rate Variability (RERV), measured as the variation of each country's RERD index around its mean during the period of 1970 to 2000, was included in the analysis. Estimation C6 shows that the RERV is significantly negatively related to economic growth after controlling for the standard growth explaining variables. The R^2 increases to over 56%. Accordingly countries with an instable real exchange rate seem to have lower economic growth rates. As can be seen from the regression C7 tourism is related to more stable real exchange rates. The lnT7000 variable has a negative coefficient, significant at the 5% level; the R^2 is at only 5%. Figure 5.6 presents the scatter plot of the estimation C7. This result illustrates once more the fact that the regression analysis does not explain any causality. It could well be that a stable real exchange rate is the precondition for tourism.

This is especially interesting when recalling Copeland (1991) who showed that the appreciation of the real exchange rate is a major mechanism by which tourism can benefit the economy, unless one assumes factor mobility. In the presence of factor mobility the model shows that the benefits of a tourism boom are much smaller as the price of non-tradables is less responsive to demand shocks. Given the 30 year period of our econometric analysis it appears to be fair to assume factor mobility to affect the price level of tourism dependent countries.

5.4. Tourism and Taxes on Goods and Services

In Copeland's model domestic commodity taxes can increase the benefits of tourism, since they allow for some rents from the unpriced natural amenities. In the following we shall try to shed light on this second possible mechanism by which countries could gain from tourism.

In fact regression D2 in table 5.7 (as well as figure 5.7) confirms the idea that countries with high income from tourism have high revenues from taxes on goods and services too. The coefficient of the tourism dependency variable is positive and highly significant in explaining the variable lnTX7000, which is the natural log of the share of taxes on goods and services in % of the value added of industry and services, averaged over the period of 1970 to 2000[20]. The goodness of fit of the model as expressed by the R^2 is at about 13%. Due to some taxation data limitations the data set used in this table slightly diminished to 91 observations.

However, estimation D1 demonstrates that given the usual growth explaining variables taxes on goods and services do not seem to be related to economic growth in the one way or the other. The coefficient of the taxation variable is completely

[20] Again, this variable does not necessarily represent an average of the whole period of 31 years. Rather, it represents an average of years due to data availability.

insignificant. This is understandable when considering the fact that government funds can be used either in a productive or unproductive manner. Nevertheless, especially developing countries are in need of public funds for e.g. infrastructure investment that could move their economy from a bad to a good equilibrium (as discussed in the 'Big Push' theory). Additional tax revenues from tourism could make public investment with positive externalities more likely to happen. For a detailed elaboration of the 'Big Push' theory and empirical evidence of the impact of infrastructure investment on the economic development of nations see Rosenstein-Rodan (1943), Murphy, Shleifer and Vishny (1988), Barro (1989), Easterly and Rebelo (1993) and Canning and Bennathan (2000).

5.5. Tourism and Manufacturing

Though Copeland's model can't make clear predictions with respect to the effects of a tourist boom on the pattern of production in other sectors, it can be shown in a simple version of the specific factors model incorporating international capital mobility that tourism can lead to a contraction of manufacturing output. In this section the relationship between tourism and manufacturing shall be analysed empirically.

In this respect data for manufacturing value added in % of GDP averaged over the period of 1970 to 2000 was used (as data on manufacturing output is not available for that many countries and years). Here the number of observations decreased to 93. Estimation E1 in table 5.8 includes the variable for manufacturing in the standard growth model setting. Unsurprisingly this variable has a positive coefficient. However it is more surprising that it is significant only at the 15% level. It could be that on the one hand the positive external effects commonly linked to the manufacturing sector are already captured to some extent by the human capital variable. On the other hand it might be true that the manufacturing value added variable does not only capture the innovative and internationally competitive manufacturing sector but also relatively unproductive manufacturing in rather protective countries which were applying an infant industry policy (or other types of development policies with e.g. a communist emphasis on heavy industry) in the period between 1970 and 2000.

Column E2 in table 5.8 (and figure 5.8) presents the results of a regression where the dependent variable was the share of manufacturing value added in GDP and the independent variable the share of tourism income in GDP. Interestingly enough the coefficient of the latter variable is positive, though only significant at the 10% level. The R^2 reaches no more than 3%. Thus, at least one can say the following: countries with high income from tourism do not have a lower than average share of manufacturing value added, rather the opposite might be true.

This is a somewhat unexpected result given the implications of the model by Copeland (1991). The explanation is most probably connected to the general outward oriented character of tourism as well as its positive link to investment and human capital as already analysed in the sections above.

Given the possible deficits of the manufacturing value added variable to represent in particular the innovative and internationally competitive manufacturing sector as discussed above it was tried to use another manufacturing variable for the purpose of this research in addition. The focus was put on manufacturing trade as a proxy for the importance of the inventive and internationally competitive manufacturing sector.

In this respect data for manufactures exports and imports in % of GDP averaged over the period of 1980 to 2000 was used. Unfortunately no data prior to 1980 was available. Therefore the other data applied in the regressions as presented in table 5.9 was reduced to that period too. Here the number of observations increased to 97. Estimation F1 includes the variable for manufactures exports in the standard growth model setting. Unsurprisingly this variable has a positive coefficient which is statistically highly significant. This result hints (similarly to the outward orientation indicator in the section on the real exchange rate) at the positive external effects commonly linked to international trade in general and the exports of manufacturing products in particular.

Note that the inclusion of manufactures exports in the estimation F1 reduces the significance of the coefficient of the human capital variable to the 5% level. One could interpret this as an indication of the importance of manufacturing trade in the process of technology transfer, partly superior to secondary school enrolment which is the proxy of human capital in this setting.

Again without claiming to estimate a fully fledged model explaining manufacturing exports column F2 in table 5.9 (and figure 5.9) presents the results of a regression where the dependent variable was the share of manufacture exports in GDP and the independent variable the share of tourism income in GDP. Interestingly enough the coefficient of the latter variable is positive (0.5) and highly significant. The R^2 reaches 21%. The correct interpretation of the result goes as follows. A one percent increase of the share of tourism revenues in GDP increases (ceteris paribus) the share of manufacturing exports in GDP by about one half of a percent.

Yet again, this is a rather unexpected result given the implications of the model by Copeland (1991). Once more, the explanation is most probably connected to the general outward oriented character of tourism as well as its positive link to investment and human capital as already analysed in the sections above.

Nonetheless, there might also be a simpler and rather structural explanation for this strong relationship. Given the fact that both variables in estimation F2 are export variables as shares of GDP they might stand for the exactly same thing – trade openness. In this case the result would be driven very much by the fact that small countries are more trade open and big countries are less.

As can be seen from the estimation F4 (and the figure 5.10) tourism is also positively related to the imports of manufacturing goods, which is a feature that was to be expected. However, the results of the estimation F3 demonstrate that manufactures imports do not explain GDP per capita growth in the long run given the standard growth explaining variables. The coefficient of the manufacturing imports variable is absolutely insignificant. In the first place this seems to be a rather unexpected result.

Levine and Renelt (1992) found out that all findings on economic growth using the share of exports in GDP could be obtained almost identically by using the total trade or import share, implying that all of these indicators stand for trade in a more general sense. However, in the present research the focus is on manufacturing trade as a proxy for the internationally competitive manufacturing sector. In this respect one could argue that while imports of manufacturing goods can be either productive (investment goods) or unproductive (consumer goods) in the longer run, exports of manufactured goods should be connected to a productive activity irrespectively whether those goods are consumer or investment goods.

In a last attempt to analyse the relationship between tourism and manufacturing in a cross country setting it was tried to circumvent the above discussed problem of both manufacturing exports and tourism revenues as shares of GDP. Therefore the standard growth regression for the period of 1980-2000 was augmented by the variable for total exports of goods and services as percentage of GDP in a first stage (see estimation G1 in table 5.10), in order to control for trade openness. Somewhat surprisingly, the coefficient of this variable is absolutely insignificant. Thus it can be stated that it really depends what a country exports and not how much of it. In fact this result is in line with the findings of Levine and Renelt (1992) where they found out that the ratio of exports to GDP is not robustly correlated with growth when investment is included in the regression. Nonetheless in a second stage the share of manufacturing exports in total exports of goods and services was added in the regression equation (see estimation G2). As it was expected, the coefficient is positive and highly significant. Regressing now manufacturing exports in total exports of goods and services on tourism revenues as a share of total exports of goods and services yields a rather meagre result. Estimation G3 has a R^2 of only 2% and though the coefficient of the tourism variable is positive it is significant at the 20% significance level only. Yet again and similar to some of the results above one can say at least that countries with high income from tourism do not have a lower than average share of manufacturing exports, rather the opposite might be true.

5.6. Sensitivity Analysis

This sensitivity analysis will focus on 'the main' estimation A4 in table 5.1, which tried to explain the growth of GDP per capita by initial GDP per capita, a proxy for physical and human capital as well as a tourism dependency variable over the period of 1970 to 2000. The use of a large scale sensitivity analysis similar to the so called 'Extreme Bound Analysis' (EBA) would be somewhat exaggerated for the purposes of this research. EBA was originally developed by Leamer (1983, 1985) and further applied and changed by Levine and Renelt (1992) and Sala-i-Martin (1997)[21]. Rather a more simplified sensitivity analysis will be used (similar to the one employed in Dollar 1992), checking for alternative specifications and data samples.

First it was tried to find and use alternative measures for tourism dependency, other than the one that was actually applied in the cross country analysis and that was calculated with the help of the International Monetary Fund (IMF) Balance of Payments (BoP) and National Accounts databases, using travel income data from the first and GDP data from the latter. The other two variables related to income from tourism stem from the World Development Indicators 2003 (WDI 2003) database as provided by The World Bank. The one is called travel services and its source is the IMF BoP database (including World Bank staff estimates) too, while the other one is called international tourism receipts and stems from the World Tourism Organisation Yearbook of Tourism Statistics. However all three variables (transformed into shares of current GDP) are pretty similar and have most probably the same BoP source anyway. Nevertheless there are some minor differences in the coverage of countries and years in the case of the applied and the first alternative variable. The variable from the World Tourism Organisation however covers only the period from 1990 to 2000 and it could be that there are some minor differences in the definition[22]. Applying the first alternative tourism dependency variable (travel services) in our standard growth model yields very similar results compared to the A4 estimation. The coefficient is also positive and in the same order of magnitude. In some cases (depending on the number of observations used for the regression) the significance of the alternative tourism variable is even somewhat higher. The second alternative tourism variable (international tourism receipts) had to be compared to the other two in the 1990-2000 setting. The international tourism receipts variable's coefficient

[21] For a current and in depth analysis of this topic see Hoover and Perez (2000).

[22] The WDI 2003 database provides the definitions of the two tourism variables as follows. Travel services covers goods and services acquired from an economy by travellers for their own use during visits of less than one year in that economy for either business or personal purposes. International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts should include any other prepayment made for goods or services received in the destination country. They also may include receipts from same-day visitors, except in cases where these are so important to justify a separate classification.

proves to be completely insignificant in this model, while the first alternative and the original variable remain significant at the 10% and 15% significance level at least. However, the whole growth model doesn't work for that short period anyway. In all the three versions the coefficients for initial GDP per capita and the human capital are totally insignificant, leaving only the coefficient for the physical capital variable significant at the 5% level. Probably 10 years are not enough to check for long term determinants of economic growth. A third alternative tourism dependency variable was identified. The WDI 2003 database provides a figure for international tourism number of arrivals. However this indicator only exists for the 1990-2000 period too and in addition to that it is not clear whether it makes sense to use it (e.g. as a share of population[23]) in the growth equation from a theoretical point of view. In the end it seems to be reasonable to stick to the original IMF BoP travel income data as it was directly used from the original source.

Second, the growth model including tourism was applied for different time periods. As it was shown in the previous paragraph the significance of the coefficient of the original tourism variable drops to the 15% significance level when the period of analysis is reduced to 1990-2000. The sign and the order of magnitude of the coefficient remains fairly the same as compared with the results from estimation A4. Using the dataset of 97 observations for the period of 1980-2000 from the estimations on manufacturing trade in table 5.8 and introducing the tourism dependency variable in the standard growth estimation leaves the coefficient of that variable positive and significant at the 10% level. Again as in the previous case the significance of the initial GDP per capita and the human capital variables' coefficients is diminishing to a certain extent but still the coefficients remain significant at the 1% level. Thus it can be noted that the tourism dependency variable is losing statistical significance in explaining GDP per capita growth the shorter the period of observation is.

In a third step the quality of the averaged variables of human capital and tourism dependency was improved stepwise resulting in a reduction in the number of total country observations in the regression. As it was noted earlier, both variables do not

[23] This was actually done in an interesting panel data study on tourism and economic growth in Latin America (see Eugenio-Martín, Martín Morales and Scarpa, 2003).

necessarily represent an average of the whole period of 31 years. Rather, they represent an average of years due to data availability. In the original setting of estimation A4 the human capital variable has a mean of 24 and the tourism variable a mean of 23 observations per country. The total number of country observations in the regression is 96. Allowing stepwise for the exclusion of countries from the regression for which one of the two variables was calculated with the help of less than 10, 16, 20, 21 or 23 observations respectively yields a reduction of the total number of observations in the regression to 90, 80, 69, 68 and 61 respectively. In all those cases the coefficient of the tourism dependency variable remains significant at the 10% level. Only after increasing the quality requirement to 25 or more observations per country for the two variables and therefore reducing the total number of country observations in the regression to only 35 the coefficient of the tourism variable becomes absolutely insignificant. The trouble is that by improving the quality of the variables that have been calculated as averages a lot of information is lost due to the fact that the two variables have not necessarily weak averages for one country at the same time.

The fourth sensitivity check was to test for differences in the sample of estimation A4 according to the division in rich, medium income and poor countries in the initial year 1970. Thus the A4 growth regression was run on sub-samples using the poorest, richest and middle two and later one thirds of the countries in 1970. In the case where two thirds of the sample were used, the tourism variable's coefficient remains significant for the poorest 66% at the 15% level, for the middle income two thirds at the 5% level and for the richest 66% at the 10% significance level. In the case where only one third of the sample was used for the regression, the tourism dependency variable's coefficient is significant only at the 15% level. A very interesting case is the cross country growth regression for the central 33% of the sample. Here the coefficients for all the four independent variables (initial GDP per capita, physical and human capital as well as tourism dependency) loose their significance at a 15% significance level. This is a somewhat puzzling result, though one has to bear in mind that it is based on only 32 observations.

Fifth and similar to the last sensitivity check the sample was divided into two sub-samples of countries according to the size of tourism dependency. Again, the A4 growth regression was run on the sub-samples. In the case of the sub-sample of half of the countries which are more dependent on tourism, the coefficient of the tourism variable remains significant only at the 20% significance level, in the opposite case at the 10% significance level only. As the significance of tourism dropped in both cases it could be interpreted that there is no reason to believe in non-linearity.

The sixth check was to look at the smaller countries with lower population in the sample. Concentrating at the 58 countries in the sample with less than 30 million inhabitants (on average over the period) lead to a drop of the significance of the tourism (and the human capital) coefficient to the 10% significance level. A further limitation to 48 countries with less than 15 million inhabitants made the coefficients of initial GDP per capita, human capital and tourism dependency insignificant at the 15% level. Only the physical capital variable remained significant.

Seventh and finally the A4 regression has been augmented by various other variables deemed at being important for explaining economic growth throughout the literature. From the Sachs and Warner (1995) database a trade-openness rating indicator (SOPEN) developed by the authors for the period of 1970-1990 was added to the A4 setting. The coefficient of SOPEN was positive and significant at the 1% level while the coefficient of the tourism dependency variable remained significant at the 5% level. From the same source a rule of law index (RL) was employed of which the coefficient was positive and significant at the 1% level while the significance of the tourism coefficient dropped to the 10% level. Dollar and Kraay (2002) used in their research a similar law and order variable (ICRGAV) averaged for the period of 1960-1995. In our setting it has a positive coefficient significant at the 1% level, while the coefficient of the tourism dependency variable stays significant at the 10% level. From the database of Transparency International a corruption perception index average for the period 1980-2000 was constructed and applied to our regression together with the tourism variable. The coefficient of the former variable is positive (a higher index number is related to a lower perception of the corruption in the country) and highly significant (1% level), the coefficient of the latter variable is significant at the 5% significance level. Using data on the GINI index from the WDI 2003 database as a measure for the inequality of income in a country (a higher index number implies more inequality) averaged for the period 1981-2001 in the growth regression yields a negative and highly significant coefficient for the GINI index and a coefficient significant at the 5% level for the tourism variable. In a similar setting the coefficient of the average share of government consumption in GDP for 1970-2000 as taken from the Penn World Tables has a negative sign and is significant at the 1% level, with the coefficient of tourism being significant at the 5% level. Another set of variables often used in growth analysis is related to the real exchange rate. Here we can rely on our data already used in the regressions of table 5.6. Applying the standard growth equation together with the Real Exchange Rate Distortion variable and the tourism variable yields in a drop of the significance of the RERD coefficient to the 10% level and for the tourism coefficient to the 15% level. Doing the same task with the variation of the RERD variable and the tourism variable leaves the former significant at the 1% level and the latter only significant at the 15% level.

Finally the same procedure was done also for the manufacturing variables used earlier in our research. The inclusion of the manufacturing value added and the tourism dependency variable (from the regressions of table 5.8) into the standard growth regression has left the first coefficient positive and significant at the 15% level and the latter positive and significant at the 5% level. The same regression was conducted for the classical growth explaining variables and manufacture exports and tourism with the help of the data as already used in the regressions of table 5.9 for the period of 1980-2000. In this setting the coefficient of the manufacturing exports variable stays positive and highly significant while the coefficient of the tourism variable becomes highly insignificant. Similar to what was noted in the discussion of estimation F1 the inclusion of manufactures exports reduces the significance of the coefficient of the human capital variable to the 5% level here too. It seems as if the manufacturing exports variable is overlapping all for what tourism is standing for and a part of what human capital represents. As already discussed in the analysis of estimation F2, both variables are export variables as shares of GDP and thus they might stand for the exactly same thing – trade openness. Again, in this case the result would be driven very much by the fact that small countries are more trade open and big countries are less. Adding finally tourism revenues as a share of total exports of goods and services as an explanatory variable in the regression G2 from the estimation table 5.10 leaves the coefficient of the manufacturing exports in total exports of goods and services positive (0.58) and significant at the 1 percentage level. The coefficient of the tourism variable is positive (0.25) and significant at the 10% level.

For additional information purposes, tables A-E in the appendix are presenting the descriptive statistics of the variables employed in the main cross country analyses of this chapter in their non-logarithmic form including averages for each variable.

5.7. Conclusions

After testing the central propositions of the model of Copeland (1991), the main empirical findings of our cross-country analysis are as follows. Countries dependent on tourism revenue do not experience lower economic growth. Rather the opposite is true. It was shown that countries with higher shares of tourism income in GDP grow faster than others after controlling for traditional growth explaining variables (initial output level, physical and human capital).

However it has to be noted that the sensitivity analysis has proven that the tourism dependency variable in the growth equation is not heavily robust. Checking for alternative specifications and data samples has let the significance of the tourism coefficient drop in many cases to the 10% level and in some cases even to the 15% significance level and below. In one case where the share of manufacturing exports in GDP was included in the growth regression the tourism coefficient lost all its significance. Thus, at least it can be said that the coefficient of the tourism dependency variable was never found to be negative.

Moreover, countries with higher income from tourism tend not only to have higher economic growth rates but also higher levels of investment and secondary school enrolment. These indirect effects of tourism could be explained by the necessities of tourism specific investment in physical and human capital as for example in transport infrastructure and the acquisition of languages.

The appreciation of the real exchange rate does not appear to be a mechanism by which tourism can benefit the economy. In fact, empirical evidence showed that tourism is not related with a higher domestic price level. Countries dependent on tourism showed to be rather outward oriented, having low levels of real exchange rate distortion and its variability.

Our cross country analysis confirmed the idea that countries with high income from tourism have high revenues from taxes on goods and services too. However, whether a country can benefit from that or not depends on the way in which the country is spending those tax revenues.

Finally, tourism seems not to lead to a contraction of the manufacturing sector. This is a rather unexpected result given the implications of the model by Copeland (1991).

To conclude, at this stage it can be said that at least in the long run there is no danger of a Dutch Disease Effect with respect to a boom in the tourism sector. Thus, no fear of a 'Croatian Disease'! Still this effect could be valid in the short run and should be analysed further in future research.

Thus, which are then the 'true' driving forces behind the economic wellbeing of tourism dependent countries in the long run? An interesting model developed by Hazari, Nowak and Sahli (2003) could give an answer to this question. Their model[24] was directly inspired by the case of Spain. Accordingly, Spain is the archetypical example of a country where economic development and industrialisation have been achieved since the early sixties via imports of capital goods mainly financed by tourism receipts. Their model can show that, as tourism usually gives rise to a monopoly power in trade, it enables the host-country to import growth from abroad (as long as foreign economic growth is strong enough relative to the domestic demographic expansion). The degree of the monopoly power in trade, as measured by the price elasticity of the export demand, exerts a strong influence on the magnitude of this transmission and a simple policy recommendation for the host country would be to increase the degree of differentiation of its tourism services.

[24] The technology is described by a Cobb-Douglas production function that exhibits constant returns to scale.

Also, the model stresses the importance of the taxation of international tourism which would (set at an optimal level) not influence the rates of growth but improve the level of national income, causing a decline in exports and output but a terms-of-trade improvement relative to a free-trade situation.

Now how does the empirical result of our cross country analysis fit into this picture? One could argue that it does surprisingly well. Assuming the internationally competitive manufacturing sector to exhibit positive externalities and economies of scale and therefore higher productivity as compared with other sectors, we could think of the countries specialised in innovative manufacturing as the 'growth leaders' (and main tourist sending countries) for the tourism destination countries. These countries in turn can use their tourism receipts to industrialise themselves by financing the imports of foreign capital goods[25] and increase own output. This could be the explanation why countries with high income from tourism do not experience a contraction of the manufacturing sector; rather the opposite might be true.

5.8. Epilogue

Using the estimated coefficients of all the classical economic growth variables (initial GDP per capita, investment share, secondary school enrolment rate) including the share of tourism revenues in GDP from estimation A4 and applying it to Croatian data would yield a prediction of Croatia's average long-run real GDP growth. The trouble with Croatia is the lack of long-run data. That's why the country wasn't included in the above analysis in the first place. However, relaxing our high demands for data quality it could be tried to make a provisional estimate.

In order to do so, the most difficult task was to estimate the initial Croatian real GDP per capita level in 1970 at purchasing power parity in 1996 international dollars, comparable to the Penn World Table Version 6.1 data as it was used in the estimations above. The statistical office of the Socialist Federal Republic of

[25] In Hazari, Nowak and Sahli (2003) foreign capital is considered to be indispensable in the production process. Domestic and foreign capital are imperfect substitutes for each other.

Yugoslavia (SFRJ) did not calculate GDP in the same manner as it was calculated in other countries of the world. In fact it calculated the Gross Material Product (GMP). This was a measure of national production which excluded most of the so called 'unproductive' economic activities such as services (*sic*!). Nevertheless, the 1970 GMP data for Croatia in millions of Yugoslav dinars was taken from the respective Statistical Yearbook of the SFRJ, together with the population data and the average USD exchange rate of that year. Prof. Vladimir Gligorov, senior economist at the Vienna Institute for International Economic Studies (wiiw) made an estimation of the 1970 purchasing power parity for Croatia (for which *inter alia* I am very grateful) and from the Penn World Table dataset the 1996 prices transformation factor was calculated. The calculations resulted in an estimated 1970 GDP per capita in 1996 international dollars for Croatia of 5091, which is a value comparable to the one of Hungary in the same year. The other data was taken from the same sources as they were used in the estimation A4, just that the averages stem from very limited time spans. The average investment share in GDP (16.4%) is based on the period 1995-2000, the average rate of secondary school enrolment (79.4%) covers the years from 1980 to 1997 and the average share of tourism income in GDP (11.7%) refers only to the period 1993-1999. Beside the fact that this data is certainly not representative for the whole period of 1970-2000 it also includes war and post war years which is an additional limitation.

Nevertheless, the available data was applied to the estimated coefficients of estimation A4 and an average rate of long-run Croatian GDP growth of 3.9% *per annum* was predicted. When compared to the growth rates of other countries over the period 1970-2000, this is a rather high average growth rate comparable to the one of Austria and Japan. If Croatia were assumed to have been grown by this rate since 1970 on average it would have reached a 2000 GDP per capita level in 1996 international dollars of more than 16000, a value similar to the one Portugal in fact reached in 2000. The reality is unfortunately a very different one. In the year 2000 Croatia had only somewhat more than 8500 international 1996 dollars of GDP per capita, half of its predicted value. In this respect it should not be forgotten that Croatia experienced more than a decade of stagnation in late SFRJ and years of war and economic transformation after its declaration of independence.

6. Panel Data Analysis

This chapter seeks at counterchecking the main results of the above cross country analysis section on the long run relationship of tourism, growth, real exchange rate and manufacturing from a panel data analysis perspective.

What are the advantages of panel data as compared to cross sectional data? For a more detailed answer to this question see e.g. Verbeek (2000) or Arellano (2003). The main advantage is that panel data can not only be used to explain why individuals behave differently but why a given individual behaves differently over time. Thus, panel data sets are typically larger than cross-sectional (or time series) data sets. Therefore, according to Verbeek (2000), estimators based on panel data are quite often more accurate and even with identical sample sizes, the use of a panel data set will often yield more efficient estimators than a series of independent cross-sections. However, the degree of complexity rises in panel data models and they might be rather seen as 'black boxes' as compared to a simple cross-country model.

Nevertheless, our main sub-questions to the general research question, again, in line with the model by Copeland (1991), which we would like to test with the help of a panel data analysis, are the following. First, do countries with a high degree of tourism dependency experience lower growth; Second, what are the indirect effects of tourism dependency via important growth factors; Third, is the appreciation of the real exchange rate a mechanism by which tourism can benefit the economy; Forth, does tourism lead to a contraction of the manufacturing sector? Here we leave aside the topic of tourism and taxes on goods and services as this relationship seems to be pretty obvious and is not at the core of our interest.

In order to answer these questions we shall try the following approaches: a Cobb-Douglas production function and a trans-log production function. In doing this we shall closely follow the methodology developed by Canning (1999) and Canning and

Bennathan (2000) who have based their papers on the findings of Kao and Chiang (1997, 1999) who argue that a dynamic OLS estimator that includes leads and lags of the first differences of the explanatory variables, has good small sample properties and gives a method of estimating consistent t statistics (see also the revised version of Kao and Chiang 2000).

Canning and Bennathan (2000) estimated social rates of return to electricity generating capacity and paved roads by comparing their effect on aggregate output to their costs of construction. In their approach the authors also tried to overcome the problem of reverse causality, with an increase in income leading to an increased demand for infrastructure. For estimating the infrastructure effects on aggregate output two methods were used.

First they ran a regression on panel data for a Cobb-Douglas production function with infrastructure (including year dummies, fixed effects, 2 lags, 1 lead). They tried to explain the log of GDP per worker for 1960-1990 by the log of capital per worker, the log of human capital per worker and *inter alia* the log of paved roads per worker. The coefficient of the last variable was positive (0.083 in column 3 of table 1 in Canning and Bennathan 2000) and significant, suggesting that paved roads have, in general, higher rates of return than other types of capital.

In order to avoid the assumption of a constant elasticity of output with respect to input, imposed by the Cobb-Douglas production function, Canning and Bennathan adopted the more complex trans-log style of production function in a second stage. Here they found out that infrastructure has rapidly diminishing returns to investment taken in isolation (the squared term being negative). However, the interactions between the infrastructure terms and the two other forms of capital were positive. This indicates that infrastructure investments are not sufficient by themselves to induce large changes in output but, that infrastructure can be a productive investment by raising the productivity of investment in other types of capital.

Thus, to sum up, we would like to follow the methodology as described in Canning (1999) and Canning and Bennathan (2000) with regard to tourism instead of infrastructure, mainly because of the following reasons. Firstly, the techniques developed in Canning (1999) based on a panel data, cointegration, analysis, allows us to overcome the problem of reverse causality (i.e. endogeneity) in an aggregate production function[26], with e.g. an increase in income leading to an increase in physical capital (for example through a savings function determining investment) and, secondly, the trans-log specification developed in Canning and Bennathan (2000) allows us to avoid the assumption of a constant elasticity of output with respect to input, imposed by the Cobb-Douglas production function as well as to examine the pattern of complementarity and substitutability between inputs into the production function.

6.1. Cobb-Douglas Production Function Estimates

Our starting point to investigate the long run impact of tourism on economic growth in a panel data Cobb-Douglas production function setting (based on the methodology of Canning and Bennathan, 2000) is a common world-wide production function given by

$$y_{it} = a_i + b_t + f(k_{it}, h_{it}, x_{it}) + \varepsilon_{it}, \qquad (2.1)$$

where y is the log output per capita, a is a country specific level of total factor productivity, and b is a time dummy capturing world-wide changes in total factor productivity while k, h and x represent the log of per capita inputs of physical capital, human capital and 'tourism capital' respectively. The term ε stands for the random error.

In this section we allow the production function f to be Cobb-Douglas, so that, in logs, we have

$$f(k_{it}, h_{it}, x_{it}) = \alpha k_{it} + \beta h_{it} + \gamma x_{it}. \qquad (2.2)$$

[26] For a critical discussion of aggregate production functions in general and the Cobb-Douglas production function in particular see the relevant footnote in the chapter above.

With regard to estimating this production function Canning (1999) emphasis that possible reverse causality might be a major problem, where capital inputs may determine output, but output may also have a feedback into capital accumulation. Canning notes that the output and capital variables might be non-stationary[27]. As a consequence, the production function may represent a long-run cointegrating relationship[28]. For this case Canning suggests to use the panel data cointegration methods of Kao and Chiang (1997), which allow each country to have its own short-run dynamic interactions and feedbacks[29]. This should give consistent estimates of the parameters of the production function that are robust to reverse causality. Thus, while the same production function is assumed to hold worldwide, the short run effects of the relationship between investment and income are allowed to vary across countries.

Therefore we shall try to estimate[30] the following equation

$$y_{it} = a_i + b_t + \alpha k_{it} + \beta h_{it} + \gamma x_{it} + \sum_{s=-m}^{m} \Phi_{is}\, \Delta k_{it+s} + \sum_{s=-m}^{m} \varphi_{is}\, \Delta h_{it+s} + \sum_{s=-m}^{m} \theta_{is}\, \Delta x_{it+s} + \varepsilon_{it}, \qquad (2.3)$$

where equation 2.1 (using 2.2) was augmented by the short run dynamic effects of lags and leads of the capital stock growth rates (indexed by s), in addition to the current growth rate (i.e., s = 0).

For the levels of output per capita y_{it} we use the natural logs of real GDP per capita between 1970 and 2000. In following closely Canning (1999), we construct a physical capital stock k_{it} (in natural logs), for the years of the period 1970-2000, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The

[27] A stationary process is such that the mean, variances and covariances of the error term do not change over time. The opposite holds true for a non-stationary process.
[28] In case there exists a particular (linear) relationship between two non-stationary series Y_t and X_t, these two series are said to be cointegrated.
[29] It is argued by Canning (1999) that simple ordinary least squares in levels (assuming stationarity although the series are in fact non-stationary) may lead to a tendency to find statistically significant coefficient estimates when in fact there is no relationship. On the other hand, simply taking first differences of all the variables, to eliminate non-stationarity, results in an estimation that relates short-run capital accumulation to short- run changes in output and may thus fail to capture the long-run relationship in levels that is at the heart of the production function.
[30] All the panel data regressions in this chapter were calculated with the help of Intercooled Stata 8.0 for Windows software.

human capital stock h_{it} is being proxied by the natural logs of the gross secondary school enrolment ratio from 1970 to 2000. Our proxy for the 'tourism capital stock' x_{it} is the natural log of the share of travel income in % of GDP for the years of 1970-2000. In fact one could see the variable x_{it} rather as an indicator of tourism dependency. However, assuming x_{it} to represent a stock of tourism capital is a working assumption in order to fit the basic assumptions of the Cobb-Douglas production function. Here one could think of a capital stock made up of e.g. natural amenities, such as climate and scenery, cultural heritage of all kinds as well as tourism related infrastructure and hospitable attitudes of the local population. The lags and leads as well as the current growth rates Δ of the respective capital stocks are the first differences of the natural logs of those capital stocks. An exact description and the sources of the variables as well as the tables with the calculation results can be found in the appendices.

However, before we turn to the actual panel data estimations we shall check for the non-stationarity of our variables. Therefore we shall carry out panel unit root tests on output per worker and each of our capital stock variables. This will be conducted with the help of an Im-Pesaran-Shin panel unit root test Stata ado software file as provided by Bornhorst and Baum (2001). The test was developed by Im, Pesaran and Shin (2003). Based on the mean of the individual Dickey-Fuller t-statistics of each unit in the panel, the Im-Pesaran-Shin test assumes that all series are non-stationary under the null hypothesis.

This test requires balanced panel data sets. That's why only data on those countries was used for which the total time series were available. In the case of human and tourism capital the period of observation was reduced in order to have as many countries included as possible. The test was conducted for each variable separately and includes 5 lags and a time trend.

The results for the unit root test for the levels of our output (y) and input (k, h, x) variables are reported in table 6.1. As expected, for the data on levels of the output variable as well as the two traditional growth explaining variables, physical and human capital, the null hypothesis of non-stationarity can not be rejected. Thus, these variables seem to be non-stationary, which is in line with the findings of

Canning (1999). However, in the case of the tourism variable, the p-value is close to zero. This implies that, here, the null hypothesis of non-stationarity has to be rejected. Variable x represents a stationary process. In general this should not prevent us from applying the proposed methodology, as described above. Canning stresses in his paper that given the results in Kao (1997) parameter estimates in a fixed effects model will be consistent even if we do not have a cointegrating relationship[31].

The results for the unit root test for the first differences of the same 4 variables are shown in table 6.2. Again, as expected, all the growth rates variables are stationary. Thus, we can confirm the results of Canning (1999) and show that the variables y, k and h are I(1)[32].

We shall start our estimation of the Cobb-Douglas production function by only looking at the two traditional explanatory variables for economic growth, namely physical and human capital. The results of these estimations are shown in table 6.3. First we estimate a standard fixed effects model[33] (estimation H1), which is normally used for estimating panel data models where the individuals in the sample are 'one of a kind' – e.g. countries. This allows each country to have its own level of total factor productivity. In estimation H2 we additionally include world-wide time dummies, which represent the world-wide level of total factor productivity that changes over time. Finally, in estimation H3, we add to the fixed effects and the time dummies the short-run dynamics that have been discussed above. These are the lag, the lead and the current value of the first differences of the capital variables. The estimated coefficients of the fixed effects, time dummies and the short-run dynamics are not reported in table 6.3.

[31] Most of all we are interested in obtaining consistent estimates. However, it might be argued that in this case the t-statistics will be wrong. The literature we have used unfortunately does not give us any hint at whether or not this is the case.
[32] The notion I(1) means integrated of order one. Thus, the respective variable is non-stationary, but stationary when first differenced.
[33] According to Verbeek (2000), essentially, the fixed effects model concentrates on differences within individuals and does not explain why one individual is different from another. On the other hand, the parametric assumptions about the estimated coefficients of the explanatory variables impose that a change in the variable has the same (*ceteris paribus*) effect, whether it is a change from one period to the other or a change from one individual to the other. However, the parameters are identified only through the within dimension of the data.

What can be observed from the results of estimation H1 is that in this simple model the coefficients of both traditional growth-explaining capital variables (physical and human) are positive and highly significant. Interestingly, after adding world-wide time dummies in estimation H2, the estimated coefficient of the human capital variable diminishes drastically and looses all its significance. Most probably this can be explained by the fact that our human capital variable, proxied by secondary school enrolment, doesn't vary very much over time. However, the few variations for the single countries seem to be better explained by the world-wide changes of total factor productivity over time (i.e. the time dummies). The inclusion of the short-run dynamics in estimation H3 does not change the results substantially. This implies that the bias in the fixed effects and time dummies model is not that big. In all three estimations the overall R^2 is around 0.95. Thus, the models explain about 95% of the variation of the dependent variable.

Finally, we run the same regressions including the variable that is at the core of our interest – x, the tourism variable. The results of these regressions are presented in table 6.4. With respect to the tourism variable, the results don't change a lot over the three specifications. Therefore we shall focus on the main estimation I3, which is the estimation of equation 2.3, as defined above.

The regression includes fixed effects, time dummies and short-run dynamics. The panel dataset used in I3 is made up of 95 countries of the world with an average of 16 years per country, which results in 1520 observations. The overall R^2 of about 97% is now slightly higher than in the regressions before. The estimated coefficient for the tourism variable is positive and highly significant (throughout all the three specifications of table 6.4). Though, the coefficient is not amazingly high. The correct interpretation of the results is, that a 1% increase in the share of tourism in GDP results in a 0.03% higher GDP per capita, given the investment in physical and human capital.

Thus, we can conclude that tourism has a long-run positive impact on the aggregate output of nations. Moreover, it could be interpreted that investment in 'tourism capital' may lead to a higher rate of return than investment in physical capital. The methodology used in estimation I3 should rule out the possibility of reverse causality.

In the following the model shall be tested with regard to the underlying assumptions of the panel data analysis. Verbeek (2000) suggests to test models based on panel data for heteroskedasticity and autocorrelation. Here we have calculated a Modified Wald statistic for groupwise heteroskedasticity in fixed effect models for estimation I3. The test[34] checks for each unit's errors under the null-hypothesis of homoskedasticity with a unit specific variance. For the model I3 the null-hypothesis had to be rejected. Thus at least one of the model's variables error term has a non-constant variance (i.e. is heteroskedastic). Similarly we have tested for autocorrelation of the errors across various points in time. For this we have employed the Wooldridge test[35] for serial correlation in panel-data models. The null-hypothesis is that there is no first-order autocorrelation. However, this had to be rejected too. Thus, indeed, we end up with estimation I3 having both heteroskedastic and autocorrelated error terms. The consequence is that the standard errors are distorted and thus the t-statistics for the calculation of the significance are not any more adequate.

Nevertheless, it is possible to estimate panel corrected standard error estimates[36] for linear cross-sectional time-series models where the parameters are estimated by OLS or Prais-Winsten regression. When computing the standard errors and the variance-covariance estimates, the disturbances are, by default, assumed to be heteroskedastic and contemporaneously correlated across panels. Thus we re-estimated model I3 assuming heteroskedasticity and first-order autocorrelation. The results of this estimation are not very different from the original I3 estimation results. The significance of the coefficients diminished slightly. The main difference is now that the tourism variable is significant at the 5% significance level instead of the 1% significance level. Hence it can be concluded that neither heteroskedasticity nor autocorrelation is distorting the model very much.

[34] The test was performed with the STATA 'xttest3' ado file written by Baum (2000). The author would like to express his gratitude for the help and instructions provided by Kit Baum from the Boston College Department of Economics.
[35] This test was obtained from Drukker (2003) who has written the respective 'xtserial' STATA ado file. The test is based on Wooldridge (2002).
[36] Here we applied the STATA standard command 'xtpcse'.

We shall now turn to the second approach as suggested by Canning and Bennathan (2000) – the trans-log production function.

6.2. Trans-Log Production Function Estimates

As described above, the trans-log specification developed in Canning and Bennathan (2000) allows us to avoid the assumption of a constant elasticity of output with respect to input, imposed by the Cobb-Douglas production function as well as to examine the pattern of complementarity and substitutability between inputs into the production function.

In this section we allow the production function f of the equation 2.1 to have the following logarithmic form

$$f(k_{it}, h_{it}, x_{it}) = \alpha_1 k_{it} + \beta_1 h_{it} + \gamma_1 x_{it} + \alpha_2 k^2_{it} + \beta_2 h^2_{it} + \gamma_2 x^2_{it} + \psi_{kh} k_{it} h_{it} + \psi_{kx} k_{it} x_{it} + \psi_{hx} h_{it} x_{it}. \quad (2.4)$$

Here, equation 2.2 is augmented by the squared terms of the capital inputs (allowing for either increasing or decreasing returns) as well as the interactive terms, which are the products of the three capital variables with each other.

A testable equation could therefore have the following form

$$y_{it} = a_i + b_t + \alpha_1 k_{it} + \beta_1 h_{it} + \gamma_1 x_{it} + \alpha_2 k^2_{it} + \beta_2 h^2_{it} + \gamma_2 x^2_{it} + \psi_{kh} k_{it} h_{it} + \psi_{kx} k_{it} x_{it} + \psi_{hx} h_{it} x_{it} +$$
$$\sum_{s=-m}^{m} \Phi_{is}\, \Delta k_{it+s} + \sum_{s=-m}^{m} \varphi_{is}\, \Delta h_{it+s} + \sum_{s=-m}^{m} \theta_{is}\, \Delta x_{it+s} + \varepsilon_{it}, \quad (2.5)$$

where equation 2.1 (using 2.4) was augmented by the short run dynamic effects of lags and leads of the capital stock growth rates (indexed by s), in addition to the current growth rate (i.e., s = 0). For an explanation of the inclusion of short-run dynamic effects in the equation see the section above.

Table 6.5 reports the results of the trans-log production function estimates, first for physical and human capital only and then for all the three inputs as put forward in equation 2.5. Again, the results for the fixed effects, time dummies and the short-run dynamics are not reported in the table. Canning and Bennathan (2000) note that it is unclear whether we should put much weight on the estimated t statistics in the estimated trans-log production function because of the non-linearities in the specification.

The important results to analyse in the trans-log production function estimates are the signs and the magnitudes of the coefficients of the squared and the interactive terms.

Estimation J1, which includes only physical and human capital as independent variables, can be interpreted in the following way. The squared term for physical capital is positive while the squared term for human capital is negative. This implies that investment in the former has increasing returns while investment in the latter has diminishing returns. However, the interactive term of physical and human capital (i.e. the product of the two, kh) is positive. This suggests that the two are rather complements than substitutes.

In estimation J2 we include the tourism variable, following the equation 2.5. The inclusion of this variable doesn't change the results for physical and human capital too much. What can be observed is that the squared 'tourism capital' term is positive, thus, indicating increasing returns to investment in tourism.

Moreover, the interaction effects between tourism and physical capital are negative. This hints at the two being rather substitutes than complements. Thus, one could think of investment in 'normal' physical capital, such as a machine, to be substituted by investment in 'tourism capital', such as e.g. a golf court. The opposite holds true for the relationship between tourism and human capital, which is similar to the interaction between physical and human capital. They are complements.

To conclude, investment in 'tourism capital' can be sufficient by itself to induce an increase of output. A country must not be abundant in physical capital to profit from investment in tourism. This is good news for developing countries, wishing to increase their income level more rapidly. However, it was also shown that, in countries with higher levels of human capital, investment in tourism is more profitable.

In the following section we want to examine the propositions on the relationship of tourism, the real exchange rate and the manufacturing sector, as put forward in Copeland (1991), in a rather simplistic panel data analysis framework.

6.3. Tourism, Real Exchange Rate and Manufacturing

Similar to our cross-country analysis in the chapter before, we shall now counter check those results on the relationship between tourism, the real exchange rate and the manufacturing sector. To achieve this goal we will employ a series of rather straightforward regressions, which do not claim to be fully fledged models, explaining the real exchange rate and manufacturing value added by our tourism dependency variable.

Our first set of regression will look at the influence of tourism on the real exchange rate. Here we will again make use of the Real Exchange Rate Distortion Index (RERD) that was developed by Dollar (1992) and explained in the cross-country chapter. This index, however, is in a more general sense a measure for outward orientation, including the effects of exchange rate as well as trade policy. In fact RERD is a measure of the extent to which the real exchange rate is distorted away from a hypothetical free-trade level.

Estimation K1, in table 6.6, controls for the influence of RERD on output per capita in our traditional growth explaining panel analysis model. The model includes physical and human capital as independent variables as well as fixed effects, time dummies and short-run dynamics. The result is the expected one. A distorted real exchange rate has a negative impact on output. The estimated coefficient of -0.14 is significant at the 1% level.

In a model (see estimation K2), where tourism revenues as a share of GDP explain RERD alone (again, including fixed effects, time dummies and short-run dynamics), we can observe a negative relationship. Countries with a higher share of tourism revenues in GDP have a less distorted real exchange rate[37]. This also hints at the positive effects that tourism seems to have on the trade openness of a country. Anecdotal evidence from Croatia shows that a tourism abundant country might have a stronger import lobby, which leads to a liberal foreign trade policy.

In any case, from the above results it is obvious that the proposition of the model of Copeland (1991), that the appreciation of the real exchange rate is the main mechanism by which tourism can benefit the economy, does not hold.

We find a similar result with regard to Copeland's prediction about tourism and deindustrialisation. Table 6.7 presents the estimation results on tourism and the manufacturing sector. Our proxy for the manufacturing sector is the share of manufacturing value added in GDP[38]. In our traditional growth regression (including physical and human capital, fixed effects, time dummies and short-run dynamics), manufacturing value added has a positive influence on GDP per capita. This underlines the general assumptions on the positive external effects of the manufacturing industry. However, the coefficient is only significant at the 10% level.

Estimation L2 checks for the influence of tourism on manufacturing. Again, empirics can't support the predictions of Copeland's model. In fact, it seems that tourism dependent countries have higher than average shares of manufacturing value added in GDP. However the model's goodness of fit is extremely low. The overall R^2 is close to 0.

Table 6.8 provides on the one hand a sort of a sensitivity analysis for our tourism variable (in estimation M1) and on the other hand a quick confirmation (in estimation

[37] It has to be noted that the goodness of fit of the model is not very high. The overall R^2 is only at 4%. However, it was not intended to estimate a model for the explanation of the real exchange rate.
[38] As it was discussed in the previous chapter neither of the variables used as a proxy for manufacturing is ideal. Given the shortcomings of the manufacturing trade variables in the cross-country analysis we shall stick in this chapter to the manufacturing value added variable.

M2) whether our assumption that a distorted exchange rate is negatively related to the share of manufacturing in GDP is actually true.

In a general output explaining regression (M1) which includes, beside the tourism dependency variable, physical and human capital, RERD and manufacturing value added, as well as fixed effects, time dummies and short-run dynamics, the coefficient of the tourism variable remains positive and significant at the 10% significance level. Estimation M2 confirms that a distorted real exchange rate has a negative impact on manufacturing value added in GDP.

Thus, it becomes clear that we can't construct a causal chain that would show how tourism causes real exchange rate appreciation and thereby causes deindustrialisation, which would cause lower than average output per capita. On the contrary, tourism dependent countries are trade open and have a rather higher than average share of manufacturing. Tourism dependent countries grow faster than others.

6.4. Conclusions

The panel data analysis of this chapter has generally confirmed the results of the cross-country analysis in the previous chapter. Moreover, the higher level of complexity of our panel data analysis approach allowed us to check for the long-run effect of tourism on economic growth with the help of a methodology that aims at ruling out the possibility of reverse causality. In addition, a trans-log setting gave us the opportunity to control for possible non-linearity and the analysis of interaction effects.

The estimation of a traditional Cobb-Douglas production function, augmented by fixed effects, time dummies and short-run dynamics (to control for reverse causality) proved that tourism has a long-run positive impact on the aggregate output of nations. Moreover, it could be interpreted that investment in 'tourism capital' may lead to a higher rate of return than investment in physical capital.

A trans-log model showed that the returns to investment in ‘tourism capital’ are of increasing nature. Thus, a tourism based development strategy can be sufficient by itself to induce an increase of output. A country must not be abundant in physical capital to profit from investment in tourism. However, it was also shown that, in countries with higher levels of human capital, investment in tourism is more profitable.

Finally, our panel data revealed that we have to reject the main propositions put forward by the model of Copeland (1991). It is empirically not possible to construct a long-run causal chain that would show how tourism causes real exchange rate appreciation and thereby causes deindustrialisation, which would in turn cause lower than average output per capita. On the contrary, tourism dependent countries are trade open and have a rather higher than average share of manufacturing. Tourism dependent countries grow faster than others.

In order to sum up and answer the sub-questions that were defined in the beginning of the chapter we can note the following. First, countries with a high degree of tourism dependency do not experience lower growth; Second, ‘tourism capital’ and physical capital are substitutes, while ‘tourism capital’ and human capital are complements; Third, the appreciation of the real exchange rate is not a mechanism by which tourism can benefit the economy; Forth, tourism does not lead to a contraction of the manufacturing sector.

7. Concluding Remarks

The aim of this research was to analyse empirically the danger of a Dutch Disease Effect with respect to a boom in the tourism sector in Croatia in the long run.

The research started with a set of case studies which tried to analyse three possible causes of deindustrialisation which seem to overlap in the case of Croatia in the recent years. A Dutch Disease with regard to a boom in the tourism sector is just one of those possible causes. The other two being the transformation process of post socialist countries and the wars which occurred in the Balkans in the 1990's. This chapter deals with the three possible causes for deindustrialisation separately by showing case studies of European countries which faced similar shocks. We also had a closer look at the recent developments in the Croatian economy, providing a synthesis of the three observed phenomena.

The result made it clear that given the simultaneity of all the possible causes of deindustrialisation in Croatia it is rather difficult to asses the specific case of a deindustrialisation due to high tourism revenues in the short run. Moreover, war and transformation could be considered as transitory events, while the Croatian tourism sector might remain important in the long run. Therefore we had to rely in the following two chapters on the econometric analysis of the long run effects of a big tourism sector using data for all the countries in the world over the period of 1970-2000.

In a first econometric analysis the general, long run relationship between tourism, growth, the real exchange rate, taxation and the manufacturing sector was analysed in a cross country setting for the countries of the world in the period of 1970-2000. A panel data framework gave the possibility to counter check the acquired results. Moreover, this second approach allowed to control for reverse causality, non-linearity and interactive effects, applying a more complex methodology.

In the cross country analysis it was shown that countries with higher shares of tourism income in GDP grow faster than others after controlling for traditional growth explaining variables (initial output level, physical and human capital). Moreover, countries with higher income from tourism tend not only to have higher economic growth rates but also higher levels of investment and secondary school enrolment. Countries dependent on tourism showed to be rather outward oriented[39], having low levels of real exchange rate distortion and its variability. Finally, tourism seems not to lead to a contraction of the manufacturing sector.

The panel data analysis has generally confirmed the results of the cross-country analysis. The estimation of a traditional Cobb-Douglas production function, augmented by fixed effects, time dummies and short-run dynamics (to control for reverse causality) proved that tourism has a long-run positive impact on the aggregate output of nations. A trans-log model showed that the returns to investment in 'tourism capital' are of increasing nature. This model also showed that 'tourism capital' and physical capital are substitutes, while 'tourism capital' and human capital are complements. Finally, the panel data revealed that it is empirically not possible to construct a long-run causal chain that would show how tourism causes real exchange rate appreciation and thereby causes deindustrialisation, which would in turn cause lower than average output per capita. On the contrary, tourism dependent countries are trade open and have a rather higher than average share of manufacturing. Tourism dependent countries grow faster than others.

To conclude, it can be said that at least in the long run there is no danger of a Dutch Disease Effect with respect to a boom in the tourism sector. Thus, no fear of a 'Croatian Disease'! Still this effect could be valid in the short run and should be analysed further in future research.

However, this rather positive outlook for a tourism dependent country like Croatia should not leave Croatian economic policy makers believe that the best

[39] In this respect it is worthwhile to note that the German philosopher Peter Sloterdijk (1995) emphasises the importance of 'world-tourism' in our modern 'hyper-civilisation' being a medium of self-instruction on 'globality' for a yet diffuse 'holopathic' class. He quotes several documents of the connection between travelling and 'great-world-training' such as Buruma (1989), Schweizer (1992) and Naipaul (1990).

developmental strategy is a *laissez fair* strategy, combined with the perpetuation of the current *status quo* economic policy. Our panel data analysis showed that a distorted real exchange rate has a significantly negative impact on long run growth. Moreover, the analysis showed that low levels of real exchange rate distortion go together with high levels of tourism dependency. Thus, one way to improve Croatian growth perspectives is to allow for real exchange rate depreciation.

The other policy advice that can be learned from the theory is related to tourism itself. A simple policy recommendation for the tourism host country would be to increase the degree of differentiation of its tourism services. This could increase monopoly power in tourism exports, which enables the host-country to import growth from abroad. Thus, Croatia should try to protect the uniqueness of its tourism product rather than to compete in the segment of mass tourism.

As mentioned above, further research should be looking at the short-run effects of tourism. Here one could think of employing various econometric methods, such as for instance panel data Vector Auto Regressions (VARs) and Granger causality tests. This could provide interesting insights into the topic and may finally lay to rest the 'Fear of Croatian Disease'.

Variables: Descriptions and Sources

Note: The sources will be abbreviated as follows. **PWT 6.1**: Penn World Table, Version 6.1 (see Heston, Summers, Aten 2002). **GDN**: Global Development Network. **IMF**: International Monetary Fund. **WDI 2003**: World Development Indicators 2003 CD-ROM disc, distributed by The World Bank.

Table 4.1

nlmx
Dutch manufactures exports as a percentage of merchandise exports between the years 1962 and 2000, as provided by the **WDI 2003** database.

nlyg
Real annual GDP growth of the Netherlands from 1961-2000, in percent, as provided by the **WDI 2003** database.

nlep
Commercial energy production in the Netherlands in the period of 1961-2000, in 1000 kt of oil equivalent. The data was taken from the **WDI 2003** database and divided by 1000.

nlme
Dutch Metal-electro production index change between 1961-2000, in percent. The data stems from the CPB Netherlands Bureau for Economic Policy Analysis document 'Half a century of Dutch manufacturing - Annual Reports 1950-2000' (see Noordman, Verbruggen and Minne 2003) and can be downloaded from the cpb.nl website. The variable is a composite indicator of the branches: basic metals, metal products and machines, electrical and electronic products and instruments, transport equipment.

nlch

Dutch Chemical-linked production index change between 1961-2000, in percent. The data stems from the CPB Netherlands Bureau for Economic Policy Analysis document 'Half a century of Dutch manufacturing - Annual Reports 1950-2000' (see Noordman, Verbruggen and Minne 2003) and can be downloaded from the cpb.nl website.

nlpp

Dutch paper, printing and publishing production index change between 1961-2000, in percent. The data stems from the CPB Netherlands Bureau for Economic Policy Analysis document 'Half a century of Dutch manufacturing - Annual Reports 1950-2000' (see Noordman, Verbruggen and Minne 2003) and can be downloaded from the cpb.nl website.

Table 4.2

elyg

Real annual GDP growth of Greece from 1976-2000, in percent, as provided by the **WDI 2003** database.

eliv

Greek industrial value added as a percentage of GDP between the years 1976 and 2000, as provided by the **WDI 2003** database.

eltx

Greek travel services exports as a percentage of GDP between the years 1976 and 2000. This variable was calculated using data for travel services exports in percent of the Balance of Payments services exports and current GDP figures from the **WDI 2003** database.

Table 4.3

esyg

Real annual GDP growth of Spain from 1975-2001, in percent, as provided by the **WDI 2003** database.

esiv

Spanish industrial value added as a percentage of GDP between the years 1975 and 2001, as provided by the **WDI 2003** database.

estx

Spanish travel services exports as a percentage of GDP between the years 1975 and 2001. This variable was calculated using data for travel services exports in percent of the Balance of Payments services exports and current GDP figures from the **WDI 2003** database.

Table 5.1

lnG7000/30

Average annual growth of the natural logs of real GDP per capita between the years 1970 and 2000. The exact calculation is 100*(1/30)*ln(rgdpl00/rgdpl70). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY70

Natural log of real GDP per capita in the year 1970. The exact calculation is ln(rgdpl70). The rgdpl variable was taken from the **PWT 6.1** database and represents 1970 real GDP per capita in 1996 international dollars.

lnI7000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. The exact calculation is ln(Øki7000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS7000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The exact calculation is ln(ØS7000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS7000 can be used as a proxy for human capital.

lnT7000

Natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØT7000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT7000 can be used as a proxy for tourism dependency.

Table 5.5

lnI7000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. The exact calculation is ln(Øki7000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS7000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The exact calculation is ln(ØS7000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS7000 can be used as a proxy for human capital.

lnT7000

Natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØT7000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT7000 can be used as a proxy for tourism dependency.

Table 5.6

lnG7000/30

Average annual growth of the natural logs of real GDP per capita between the years 1970 and 2000. The exact calculation is 100*(1/30)*ln(rgdpl00/rgdpl70). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY70

Natural log of real GDP per capita in the year 1970. The exact calculation is ln(rgdpl70). The rgdpl variable was taken from the **PWT 6.1** database and represents 1970 real GDP per capita in 1996 international dollars.

lnI7000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. The exact calculation is ln(Øki7000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS7000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The exact calculation is ln(ØS7000). The S variable was taken from the **GDN** database and is there indicated as ‘School enrollment, secondary (% gross)’. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS7000 can be used as a proxy for human capital.

lnRPL7000

Natural log of the relative price level (RPL) index, averaged over the period of 1970 to 2000. The exact calculation is ln(ØRPL7000). Based on the methodology of Dollar (1992), RPL was calculated by dividing each countries price level of consumption as provided by the **PWT 6.1** database by the price level of consumption of the United States of America as the benchmark country. The exact calculation for the RPL of a given year for a given country i is $100*(pc_i/pc_{US})$. The variable pc corresponds to the price level of the consumption component in GDP in Purchasing Power Parity (PPP) over the exchange rate against the US dollar. The PPP of consumption is the national currency value divided by the real value in 1996 international dollars. The PPP and the exchange rate are both expressed as national currency units per US dollar. The original RPL formula in Dollar (1992) is the following. $RPL_i = 100*eP_i/P_{US}$, where e is the exchange rate in dollars per unit of domestic currency and P_i is the consumption price index for country i. This formulation is similar to the usual measure of the real exchange rate, except that here the price indices employed have the same weights in each country.

lnRERD7000

Natural log of the real exchange rate distortion (RERD) index, averaged over the period of 1970 to 2000. The exact calculation is ln(ØRERD7000). Based on the methodology of Dollar (1992), RERD was calculated by dividing the actual price level RPL (see above) by the predicted price level (PPL). The exact calculation is RERD = RPL/PPL*100. This provides a measure of the extent to which the real exchange rate is distorted away from a hypothetical free-trade level. Estimating the PPL is based on the assumption that there is a systematic relationship between the per capita GDP and the price level. The applied regression equation is $RPL_{it} = a + b_1*rgdpl_{it} + b_2*rgdpl^2_{it} + c_t d_t$, where the rgdpl variables for the respective countries and years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars and where the d_t's are the year dummies for each year other than 1970. The quadratic rgdpl² variable was used in order to check for the possibility of nonlinearities. This pooled, cross-section regression was estimated over 4043 observations. This regression is comparable to the regression number 6 in table 2 of Dollar 1992. Using the results from the regression yields the estimated PPL for each country and each year.

lnRERV7000

Natural log of the real exchange rate variability (RERV), measured as the variation of each country's real exchange rate distortion (RERD) index (see above) around its mean during the period of 1970 to 2000. The exact calculation is $\ln((1/N*\sum| RERD_t - ØRERD7000 |)/ ØRERD7000*100)$.

lnT7000

Natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØT7000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT7000 can be used as a proxy for tourism dependency.

Table 5.7

lnG7000/30

Average annual growth of the natural logs of real GDP per capita between the years 1970 and 2000. The exact calculation is 100*(1/30)*ln(rgdpl00/rgdpl70). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY70

Natural log of real GDP per capita in the year 1970. The exact calculation is ln(rgdpl70). The rgdpl variable was taken from the **PWT 6.1** database and represents 1970 real GDP per capita in 1996 international dollars.

lnI7000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. The exact calculation is ln(Øki7000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS7000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The exact calculation is ln(ØS7000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS7000 can be used as a proxy for human capital.

lnTX7000

Natural log of the share of taxes on goods and services in % of the value added of industry and services, averaged over the period of 1970 to 2000. The exact calculation is ln(ØTX7000). The TX variable was taken from the **WDI 2003** database. It reflects only central government data, such as e.g. value added taxes, general sales taxes and excise taxes.

lnT7000

Natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØT7000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT7000 can be used as a proxy for tourism dependency.

Table 5.8

lnG7000/30

Average annual growth of the natural logs of real GDP per capita between the years 1970 and 2000. The exact calculation is 100*(1/30)*ln(rgdpl00/rgdpl70). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY70

Natural log of real GDP per capita in the year 1970. The exact calculation is ln(rgdpl70). The rgdpl variable was taken from the **PWT 6.1** database and represents 1970 real GDP per capita in 1996 international dollars.

lnI7000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1970 to 2000. The exact calculation is ln(Øki7000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS7000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1970 to 2000. The exact calculation is ln(ØS7000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS7000 can be used as a proxy for human capital.

lnMV7000

Natural log of the share of manufacturing value added in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØMV7000). The MV variable was taken from the **WDI 2003** database.

lnT7000

Natural log of the share of travel income in % of GDP, averaged over the period of 1970 to 2000. The exact calculation is ln(ØT7000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT7000 can be used as a proxy for tourism dependency.

Table 5.9

lnG8000/20

Average annual growth of the natural logs of real GDP per capita between the years 1980 and 2000. The exact calculation is 100*(1/20)*ln(rgdpl00/rgdpl80). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY80

Natural log of real GDP per capita in the year 1980. The exact calculation is ln(rgdpl80). The rgdpl variable was taken from the **PWT 6.1** database and represents 1980 real GDP per capita in 1996 international dollars.

lnI8000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1980 to 2000. The exact calculation is ln(Øki8000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS8000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1980 to 2000. The exact calculation is ln(ØS8000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS8000 can be used as a proxy for human capital.

lnMX8000

Natural log of the share of manufactures exports in % of GDP, averaged over the period of 1980 to 2000. The exact calculation is ln(ØMX8000). The MX variable was calculated with the help of the **WDI 2003** database, using data on 'Manufactures exports (% of merchandise exports)', 'Merchandise exports (current US$)' and 'GDP (current US$)'.

lnMM8000

Natural log of the share of manufactures imports in % of GDP, averaged over the period of 1980 to 2000. The exact calculation is ln(ØMM8000). The MM variable was calculated with the help of the **WDI 2003** database, using data on 'Manufactures imports (% of merchandise imports)', 'Merchandise imports (current US$)' and 'GDP (current US$)'.

lnT8000

Natural log of the share of travel income in % of GDP, averaged over the period of 1980 to 2000. The exact calculation is ln(ØT8000). The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable lnT8000 can be used as a proxy for tourism dependency.

Table 5.10

lnG8000/20

Average annual growth of the natural logs of real GDP per capita between the years 1980 and 2000. The exact calculation is 100*(1/20)*ln(rgdpl00/rgdpl80). The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

lnY80

Natural log of real GDP per capita in the year 1980. The exact calculation is ln(rgdpl80). The rgdpl variable was taken from the **PWT 6.1** database and represents 1980 real GDP per capita in 1996 international dollars.

lnI8000

Natural log of the investment share of the real GDP per capita, averaged over the period of 1980 to 2000. The exact calculation is ln(Øki8000). The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage.

lnS8000

Natural log of the gross secondary school enrolment ratio, averaged over the period of 1980 to 2000. The exact calculation is ln(ØS8000). The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable lnS8000 can be used as a proxy for human capital.

lnXGSY8000

Natural log of the share of the exports of goods and services in % of GDP, averaged over the period of 1980 to 2000. The exact calculation is ln(ØXGSY8000). The XGSY variable was taken from the **WDI 2003** database where it is called 'Exports of goods and services (% of GDP)'.

lnMXXGS8000

Natural log of the share of manufactures exports in % of exports of goods and services, averaged over the period of 1980 to 2000. The exact calculation is ln(ØMXGS8000). The MX variable was calculated with the **WDI 2003** database, using data on 'Manufactures exports (% of merchandise exports)', 'Merchandise exports (current US$)' and 'Exports of goods and services (current US$)'.

lnTXGS8000

Natural log of the share of travel income in % of exports of goods and services, averaged over the period of 1980 to 2000. The exact calculation is ln(ØTXGS8000). The TXGS variable was calculated with the help of the **IMF** Balance of Payments and the **WDI 2003** databases, using travel income data from the first and data on 'Exports of goods and services (current US$)' from the latter.

Table 6.1

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the

International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or 'tourism capital'.

Table 6.2

dy

First differences of the natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)-\ln(rgdpl_{t-1})$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

dk

First differences of the natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)-\ln(K_{t-1})$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

dh

First differences of the natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)-\ln(S_{t-1})$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

dx

First differences of the natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)-\ln(T_{t-1})$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or 'tourism capital'.

Table 6.3

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

Table 6.4

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t = K_{t-1} * 0.93 + ki_t * rgdpl_t$ and $K_0 = 3 * rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or 'tourism capital'.

Table 6.5

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or 'tourism capital'.

Table 6.6

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t = K_{t-1} * 0.93 + ki_t * rgdpl_t$ and $K_0 = 3 * rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or 'tourism capital'.

rerd

Natural logs of the real exchange rate distortion (RERD) index for the years 1970-2000. The exact calculation is $\ln(RERD_t)$. Based on the methodology of Dollar (1992), RERD was calculated by dividing the actual price level RPL (see above) by the predicted price level (PPL). The exact calculation is RERD = RPL/PPL*100. This provides a measure of the extent to which the real exchange rate is distorted away from a hypothetical free-trade level. Estimating the PPL is based on the assumption that there is a systematic relationship between the per capita GDP and the price level. The applied regression equation is $RPL_{it} = a + b_1{*}rgdpl_{it} + b_2{*}rgdpl^2_{it} + c_t d_t$, where the rgdpl variables for the respective countries and years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars and where the d_t's are the year dummies for each year other than 1970. The quadratic rgdpl² variable was used in order to check for the possibility of nonlinearities. This pooled, cross-section regression was estimated over 4043 observations. This regression is comparable to the regression number 6 in table 2 of Dollar 1992. Using the results from the regression yields the estimated PPL for each country and each year.

Table 6.7

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year's capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as 'School enrollment, secondary (% gross)'. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or ‘tourism capital’.

mv

Natural logs of the share of manufacturing value added in % of GDP for the years 1970-2000. The exact calculation is $\ln(MV_t)$. The MV variable was taken from the **WDI 2003** database.

Table 6.8

y

Natural logs of real GDP per capita for the years 1970-2000. The exact calculation is $\ln(rgdpl_t)$. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

k

Natural logs of physical capital per capita for the years 1970-2000. The variable k_t was constructed, using a perpetual inventory method. Assuming a capital-output ratio of three in a base year (for our purpose this is 1960) we update each year’s capital stock by adding investment and subtracting as depreciation 7% of the existing capital stock. The exact calculation is $\ln(K_t)$, where $K_t=K_{t-1}*0.93+ki_t*rgdpl_t$ and $K_0=3*rgdpl_0$. The ki variable was taken from the **PWT 6.1** database and represents the investment share of the real GDP per capita in 1996 international dollars (rgdpl). It is published as a percentage. The rgdpl variables for the respective years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars.

h

Natural logs of the gross secondary school enrolment ratio for the years 1970-2000. The exact calculation is $\ln(S_t)$. The S variable was taken from the **GDN** database and is there indicated as ‘School enrollment, secondary (% gross)’. The original source is the Global Development Finance & World Development Indicators. The more detailed explanation is the following. Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on the International Standard Classification of Education (ICSED). Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Data for the years 1990-2000 was taken from the **WDI 2003** database. The variable h can be used as a proxy for human capital.

x

Natural logs of the share of travel income in % of GDP for the years 1970-2000. The exact calculation is $\ln(T_t)$. The T variable was calculated with the help of the **IMF** Balance of Payments and National Accounts databases, using travel income data from the first and GDP data from the latter. The variable x can be used as a proxy for tourism dependency or ‘tourism capital’.

rerd

Natural logs of the real exchange rate distortion (RERD) index for the years 1970-2000. The exact calculation is $\ln(RERD_t)$. Based on the methodology of Dollar (1992), RERD was calculated by dividing the actual price level RPL (see above) by the predicted price level (PPL). The exact calculation is RERD = RPL/PPL*100. This provides a measure of the extent to which the real exchange rate is distorted away from a hypothetical free-trade level. Estimating the PPL is based on the assumption that there is a systematic relationship between the per capita GDP and the price level. The applied regression equation is $RPL_{it} = a + b_1{*}rgdpl_{it} + b_2{*}rgdpl^2_{it} + c_td_t$, where the rgdpl variables for the respective countries and years were taken from the **PWT 6.1** database and represent real GDP per capita in 1996 international dollars and where the d_t‘s are the year dummies for each year other than 1970. The quadratic rgdpl² variable was used in order to check for the possibility of nonlinearities. This pooled, cross-section regression was estimated over 4043 observations. This regression is comparable to the regression number 6 in table 2 of Dollar 1992. Using the results from the regression yields the estimated PPL for each country and each year.

mv

Natural logs of the share of manufacturing value added in % of GDP for the years 1970-2000. The exact calculation is $\ln(MV_t)$. The MV variable was taken from the **WDI 2003** database.

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Tables and Figures

Figure 4.1 – Possible Causes of Deindustrialisation in Croatia

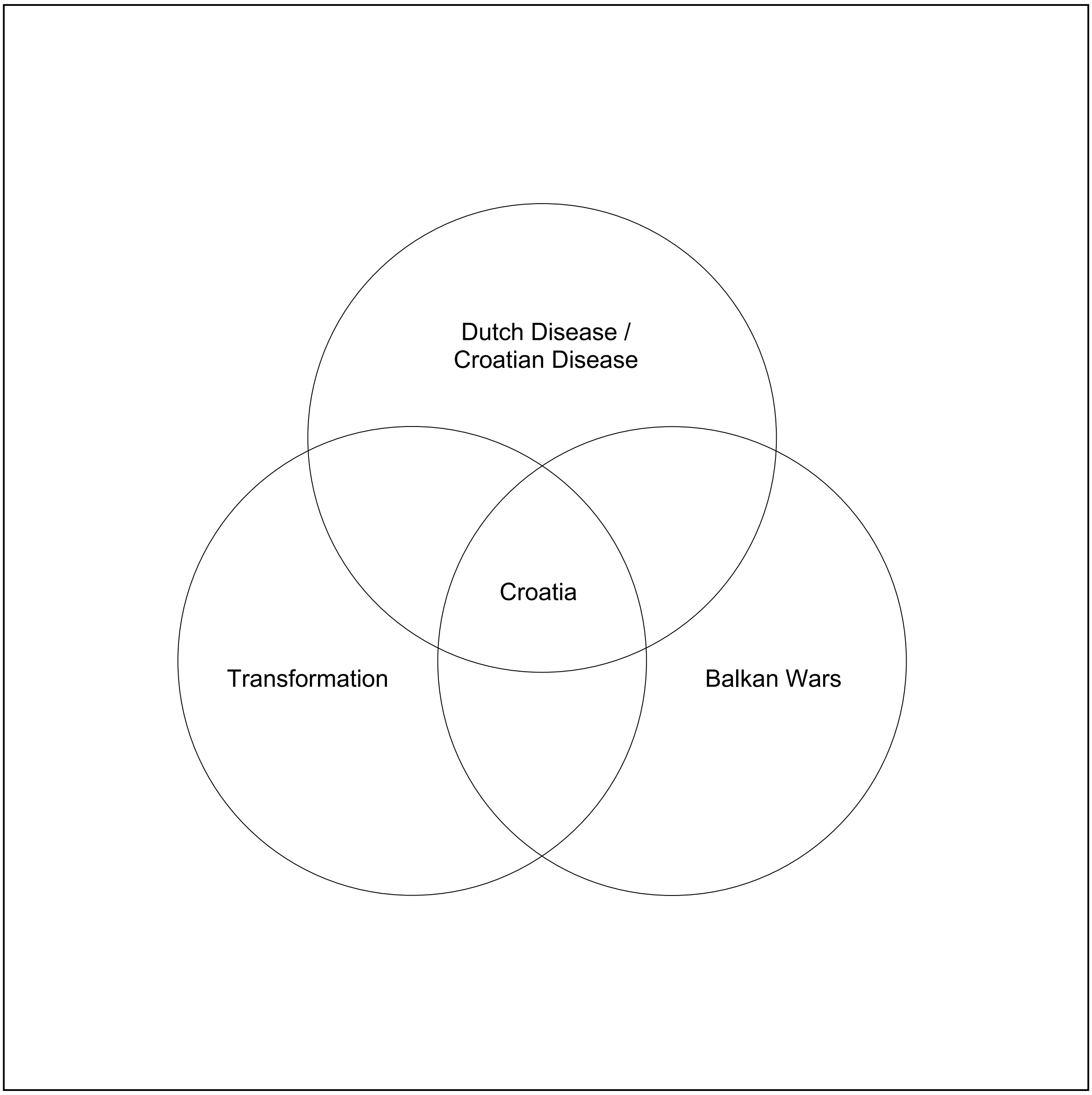

Figure 4.2 – The Netherlands and the Dutch Disease – economic development (1960-2001)

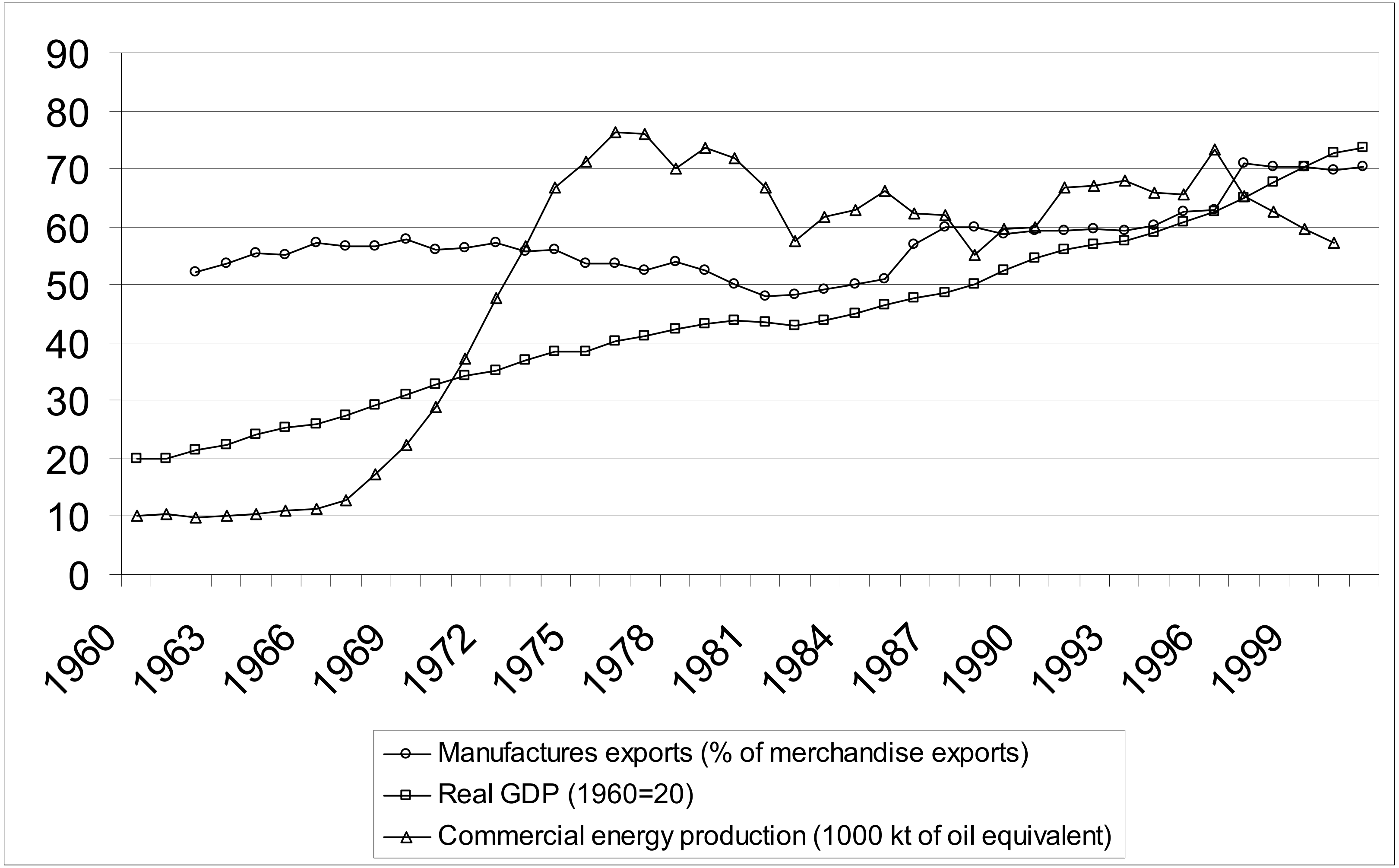

Figure 4.3 - Dutch Metal-Electro Industry, production index % change (1951-2001)

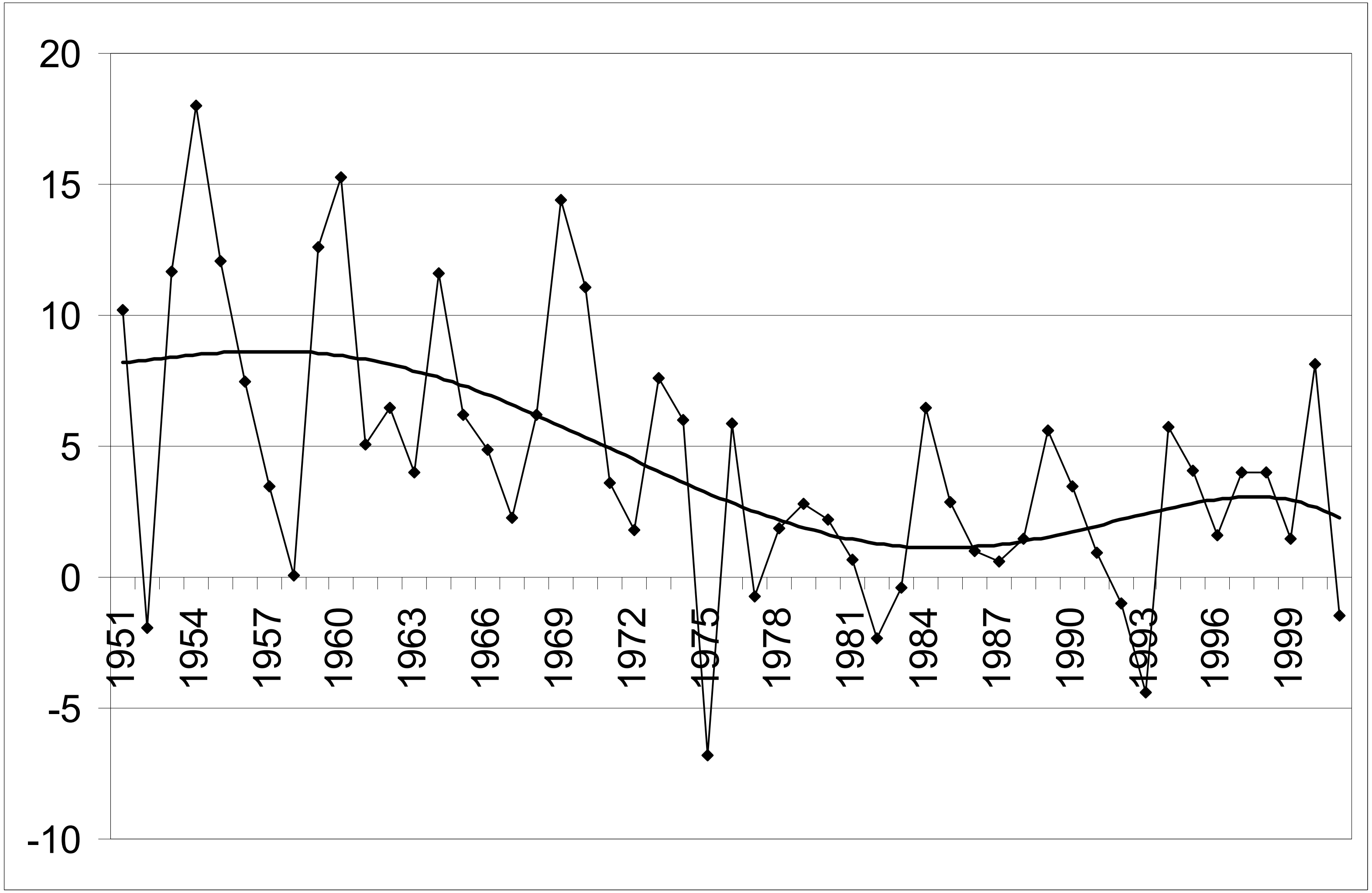

Figure 4.4 - Dutch Chemical-Linked Industry, production index % change (1951-2001)

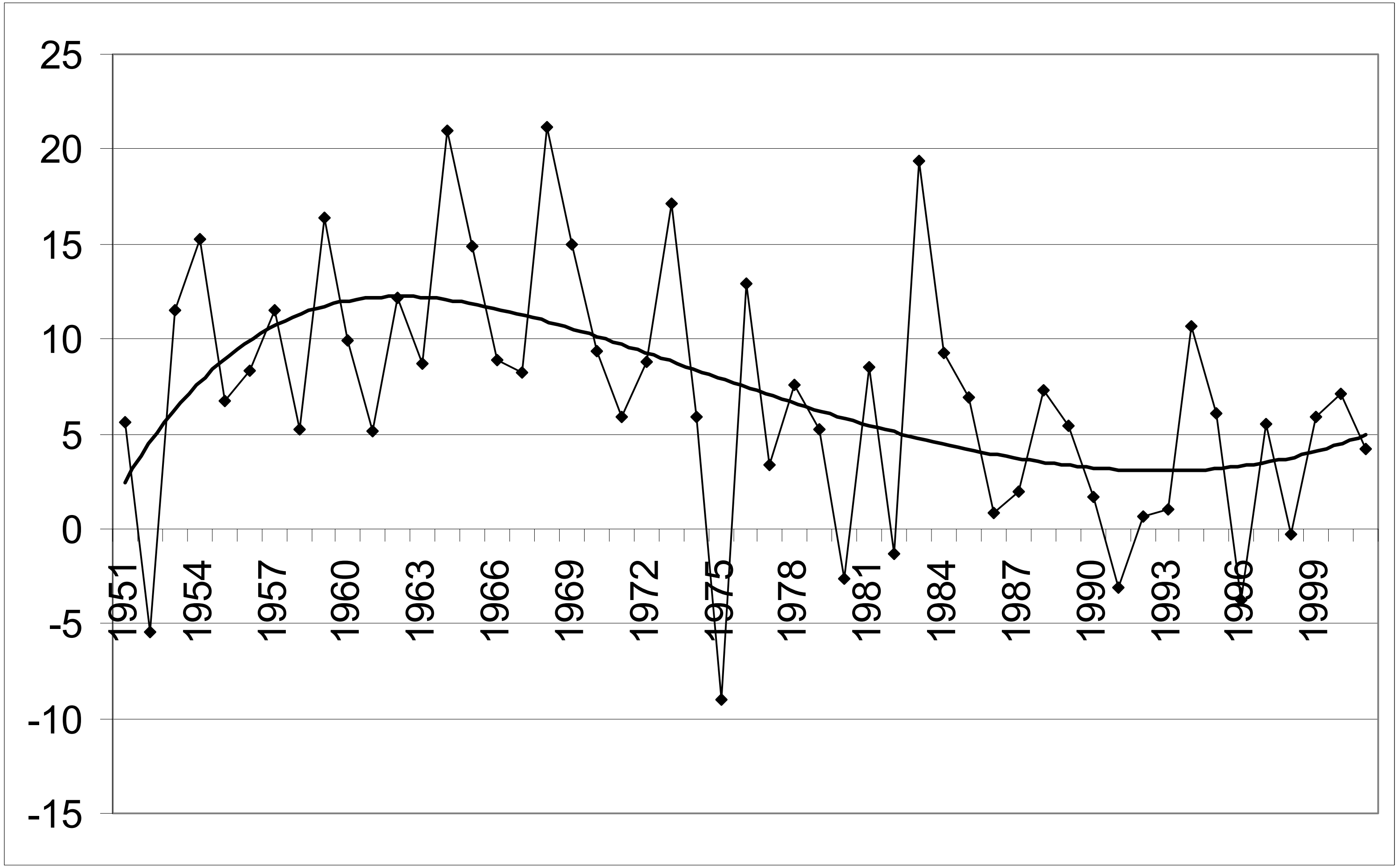

Figure 4.5 - Dutch Paper, Printing and Publishing Industry, production index % change (1951-2001)

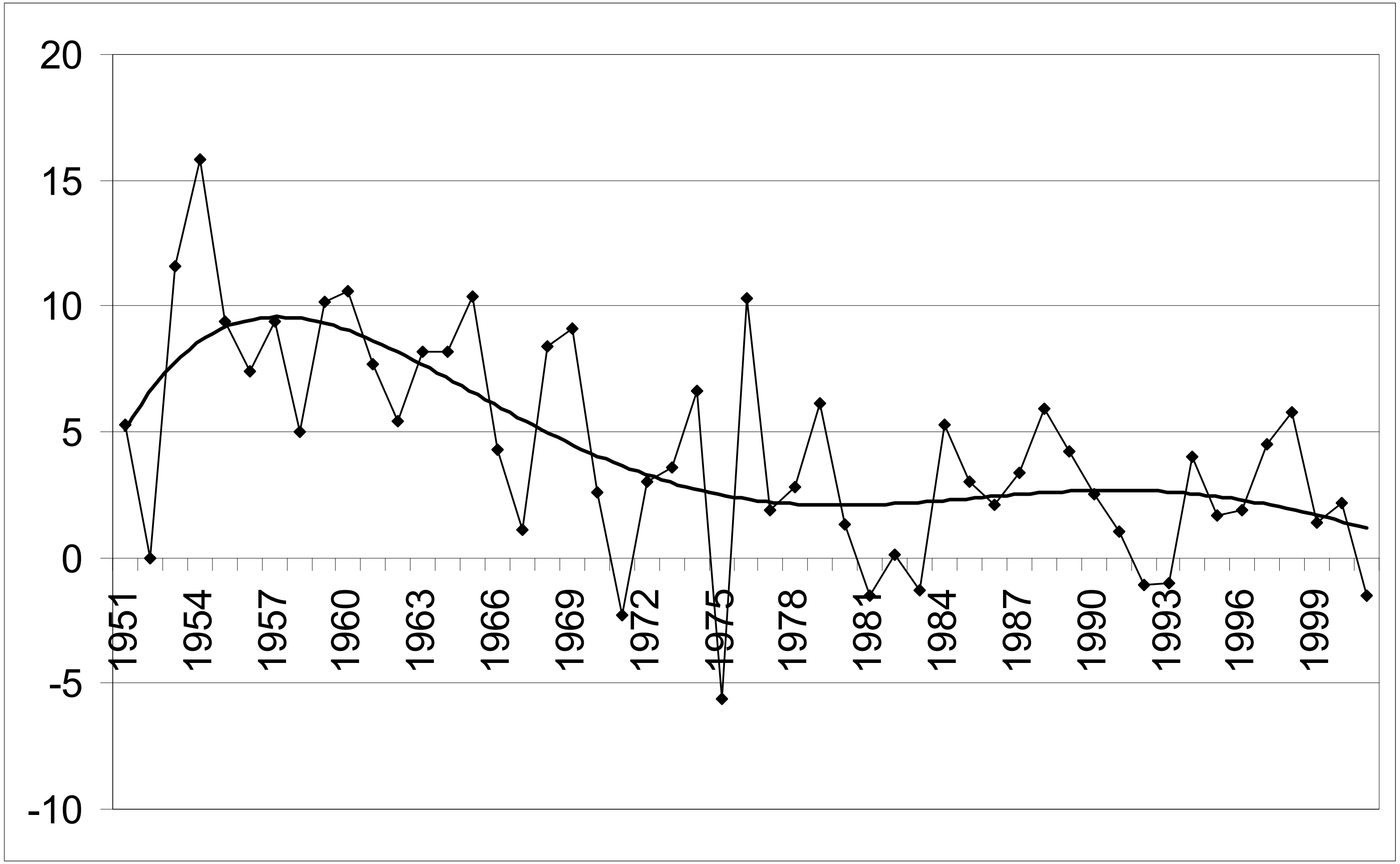

Table 4.1
The Netherlands and the Dutch Disease

Estimations:	NL1	NL2	NL3	NL4	NL5
	Dependent variables				
Independent variables	nlmx	nlyg	nlme	nlch	nlpp
Constant	55.94	6.341	0.431	5.673	2.220
	(22.82)***	(9.731)***	(0.251)	(1.688)*	(1.175)
nlep	0.023	-0.057	-0.028	-0.081	-0.031
	(0.537)	(-4.936)***	(-1.299)	(-1.921)*	(-1.331)
nlyg	-	-	1.371	1.583	0.858
			(5.658)***	(3.331)***	(3.213)***
R^2	0.008	0.397	0.603	0.441	0.378
Adjusted R^2	-0.019	0.381	0.582	0.411	0.345
Number of observations	39	39	40	40	40

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 4.6 – Greece: Economic Growth, Tourism and Industry (1976-2001)

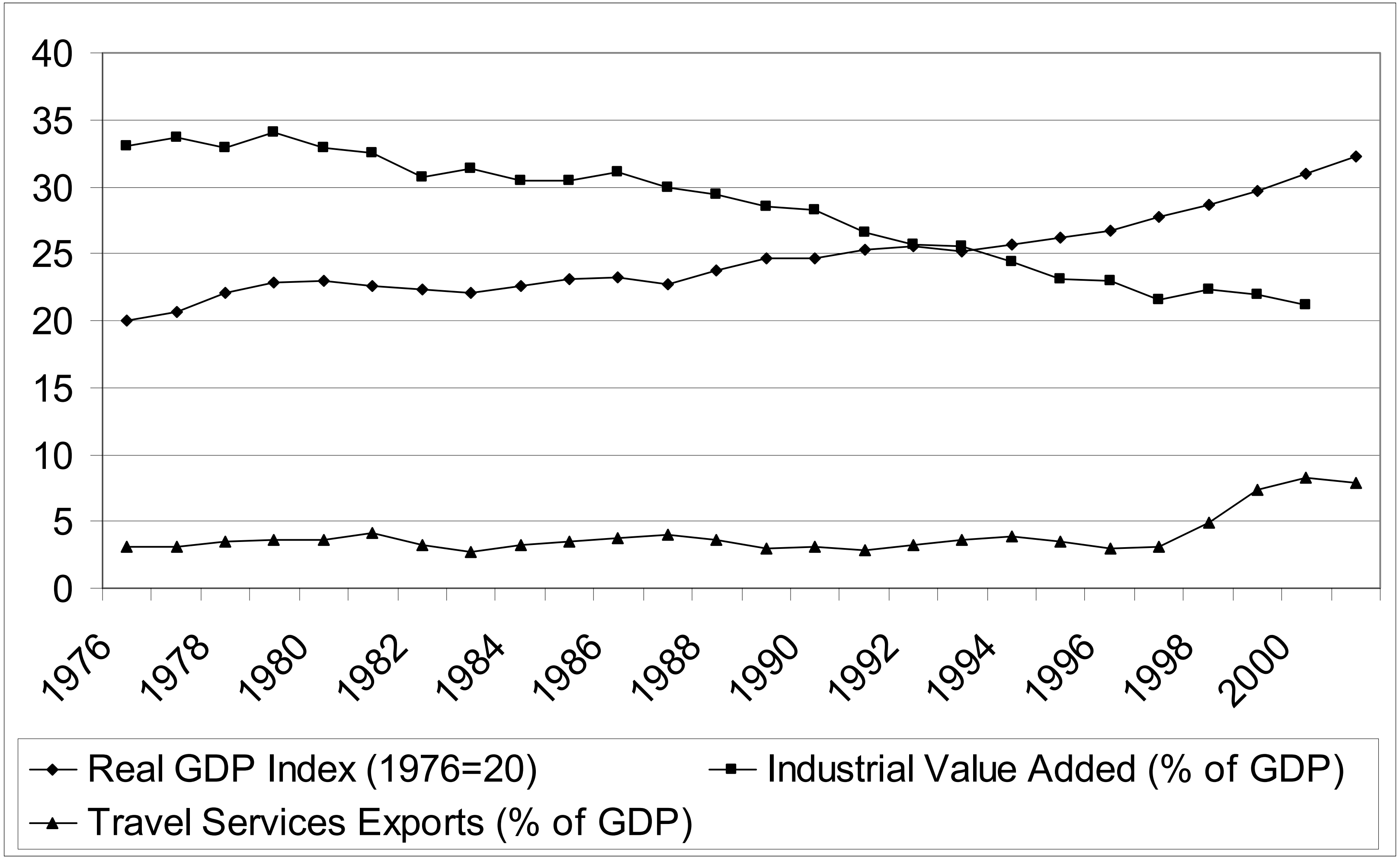

Table 4.2
Greece: Economic Growth, Tourism and Industry

Estimations:	EL1	EL2
	Dependent variables	
Independent variables	elyg	eliv
Constant	1.125	34.09
	(0.226)	(13.60)***
eltx	0.289	-1.550
	(0.633)	(-2.462)**
eliv	-0.006	-
	(-0.041)	
elyg	-	-0.014
		(-0.042)
R^2	0.024	0.221
Adjusted R^2	-0.064	0.150
Number of observations	25	25

Note. Absolute values of the *t* statistics are in parentheses.
The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 4.7 - Spain: Economic Growth, Tourism and Industry (1975-2001)

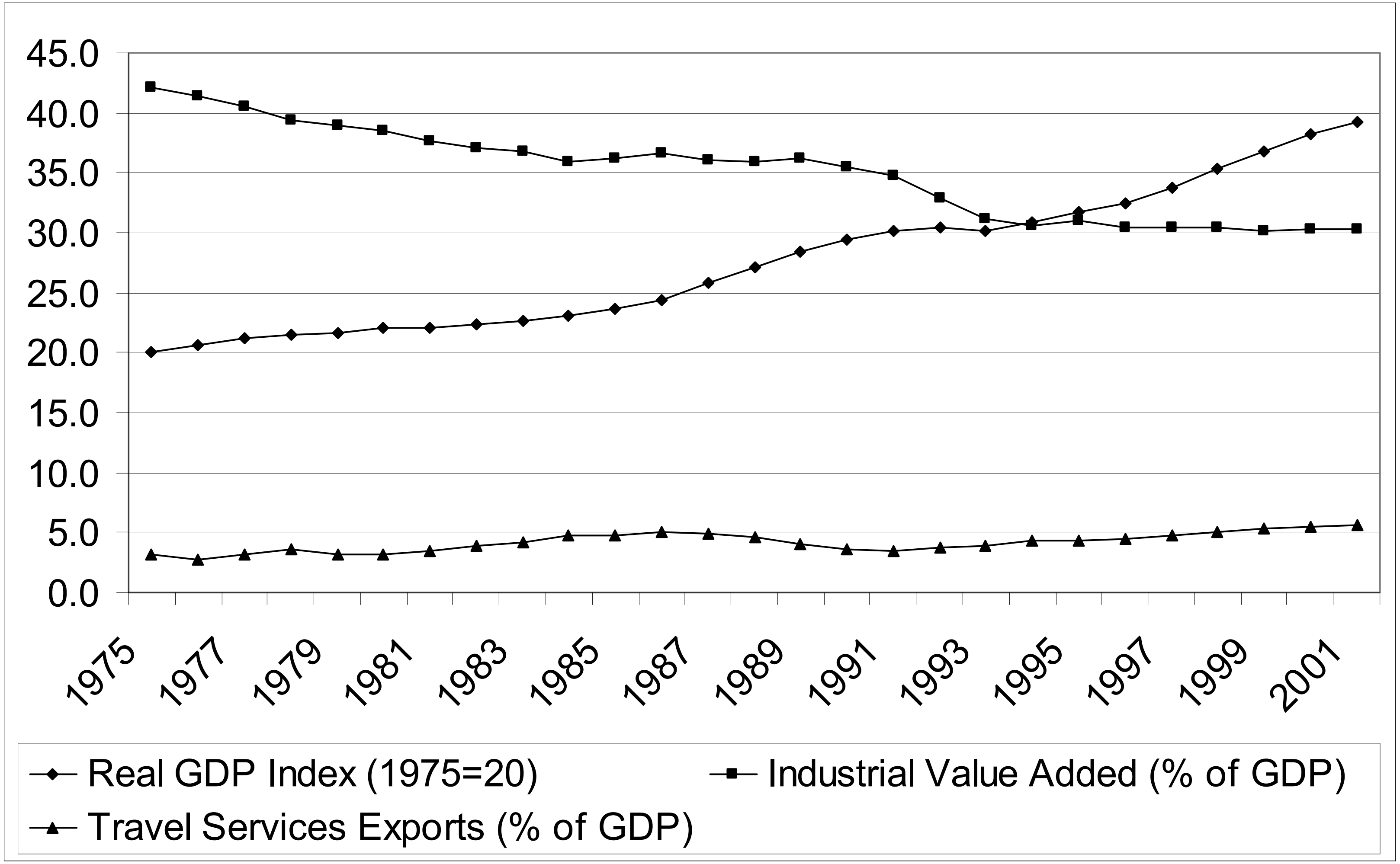

Table 4.3
Spain : Economic Growth, Tourism and Industry

Estimations:	ES1	ES2
	Dependent variables	
Independent variables	esyg	esiv
Constant	-7.082	50.05
	(-1.275)	(17.43)***
estx	1.396	-3.808
	(2.716)**	(-5.017)***
esiv	0.109	-
	(1.004)	
esyg	-	0.371
		(1.004)
R^2	0.279	0.540
Adjusted R^2	0.219	0.501
Number of observations	27	27

Note. Absolute values of the *t* statistics are in parentheses.
The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 4.8 – The Czech Republic – economic development (1990-2003)

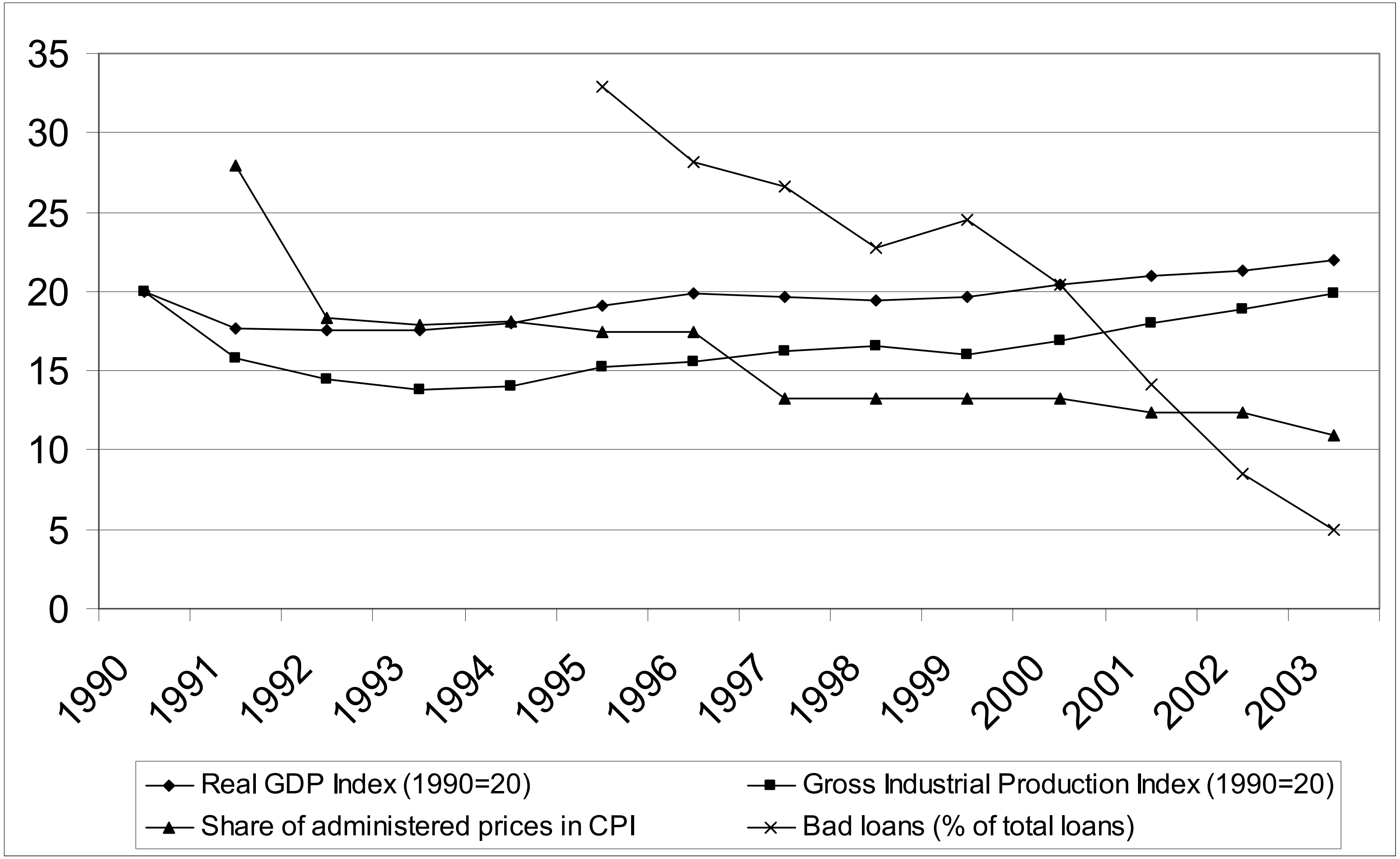

Figure 4.9 – Slovenia – economic development (1990-2003)

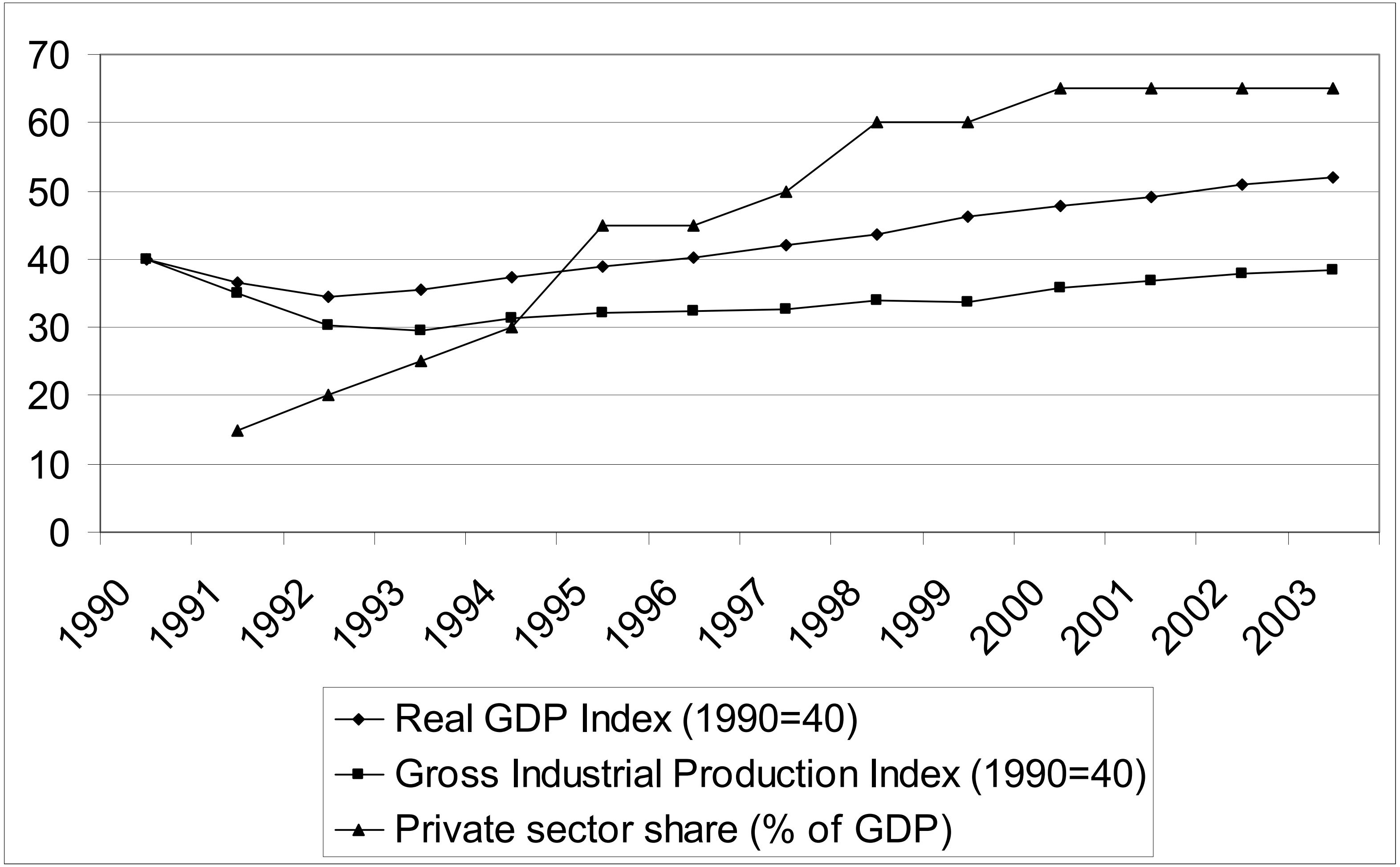

Figure 4.10 – Serbia and Montenegro – economic development (1990-2003)

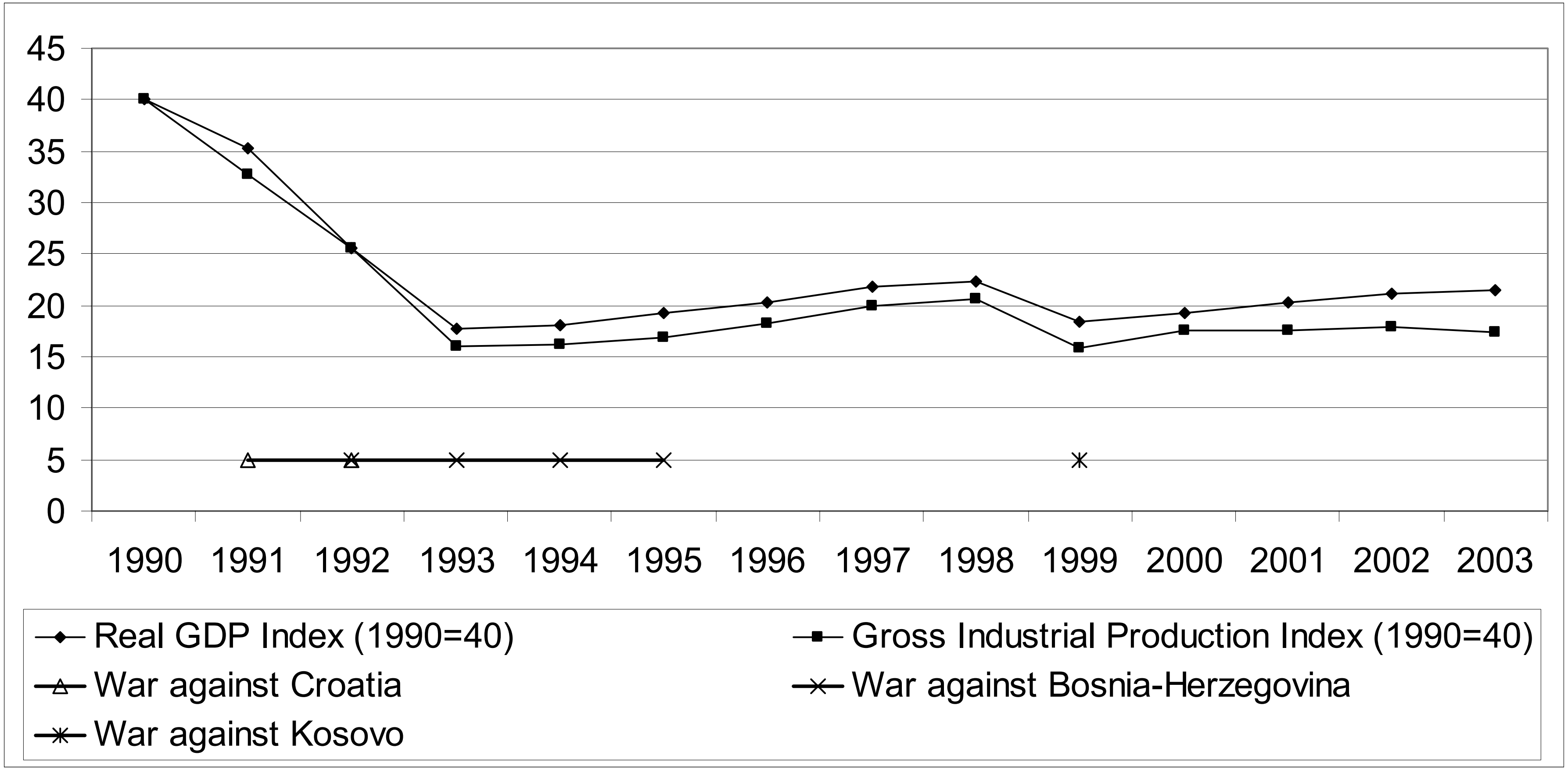

Figure 4.11 – Croatia – economic development (1990-2003)

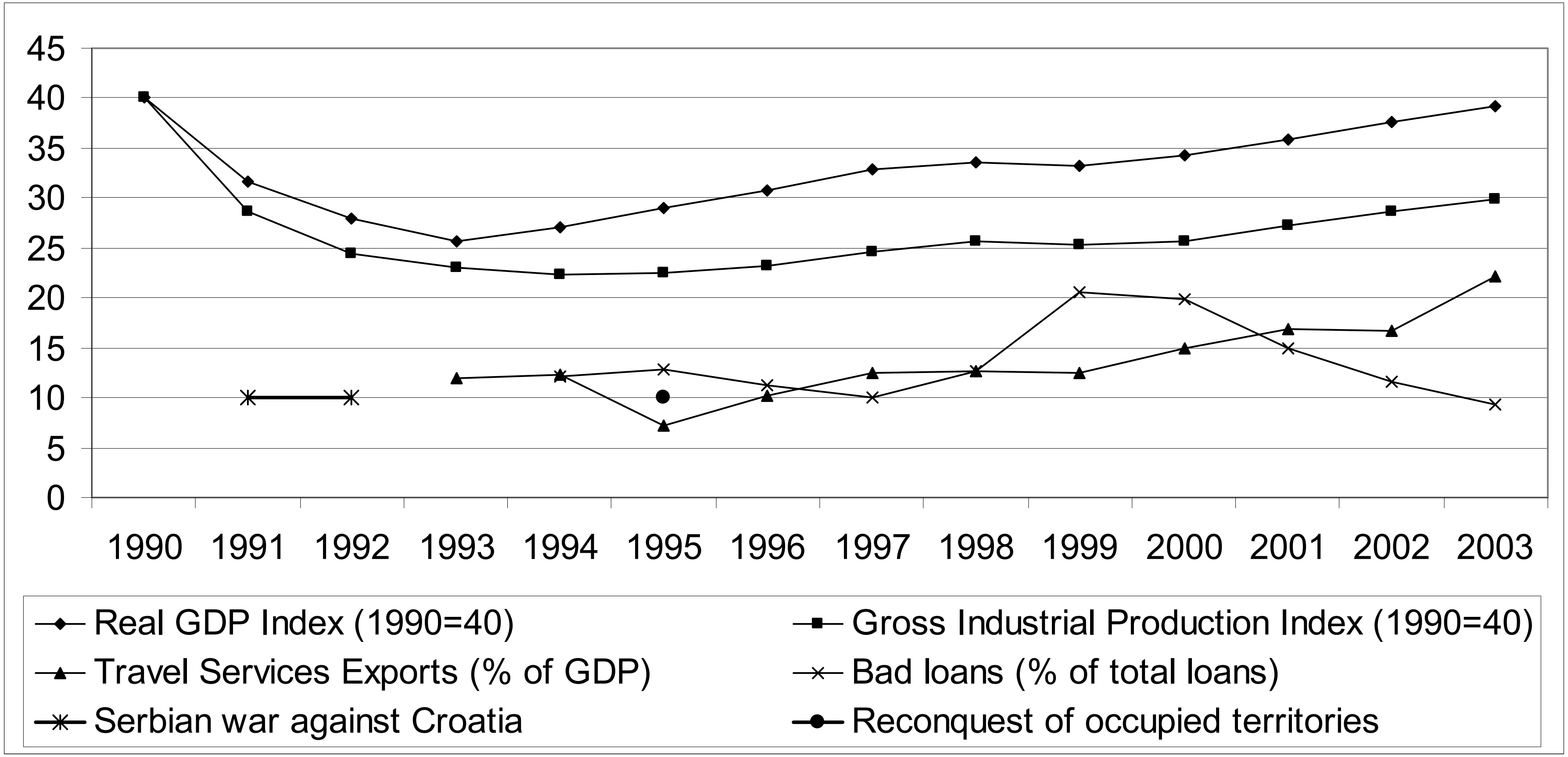

Figure 4.12 – Croatia – Real effective and nominal exchange rate index of the Croatian kuna against the euro (2001=100)

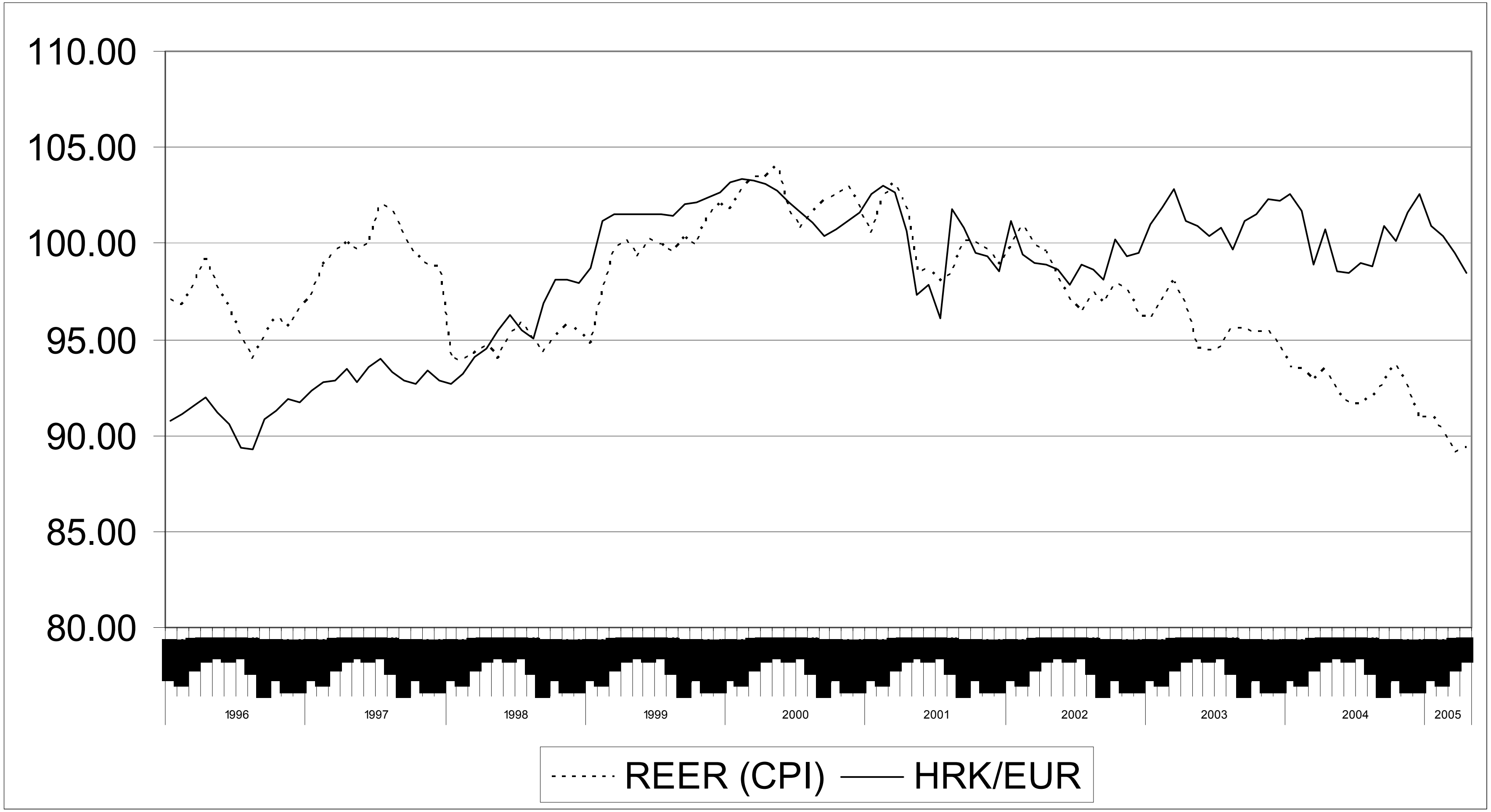

Table 5.1
Tourism and Economic Growth

Estimations:	A1	A2	A3	A4
	Dependent variables			
Independent variables	lnG7000/30	lnG7000/30	lnG7000/30	lnG7000/30
Constant	1.425 (8.649)***	-0.022 (-0.017)	-0.113 (-0.104)	1.405 (1.291)
lnY70	-	0.181 (1.087)	-0.486 (-2.935)***	-0.978 (-4.902)***
lnI7000	-	-	2.067 (6.982)***	1.358 (4.111)***
lnS7000	-	-	-	1.172 (3.887)***
lnT7000	0.437 (3.162)***	0.394 (2.745)***	0.333 (2.847)***	0.244 (2.194)**
R^2	0.096	0.107	0.417	0.500
Adjusted R^2	0.087	0.088	0.398	0.478
Number of observations	96	96	96	96

Note. Absolute values of the *t* statistics are in parentheses. The superscripts *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 5.1 – Regression A4 – Tourism and Growth

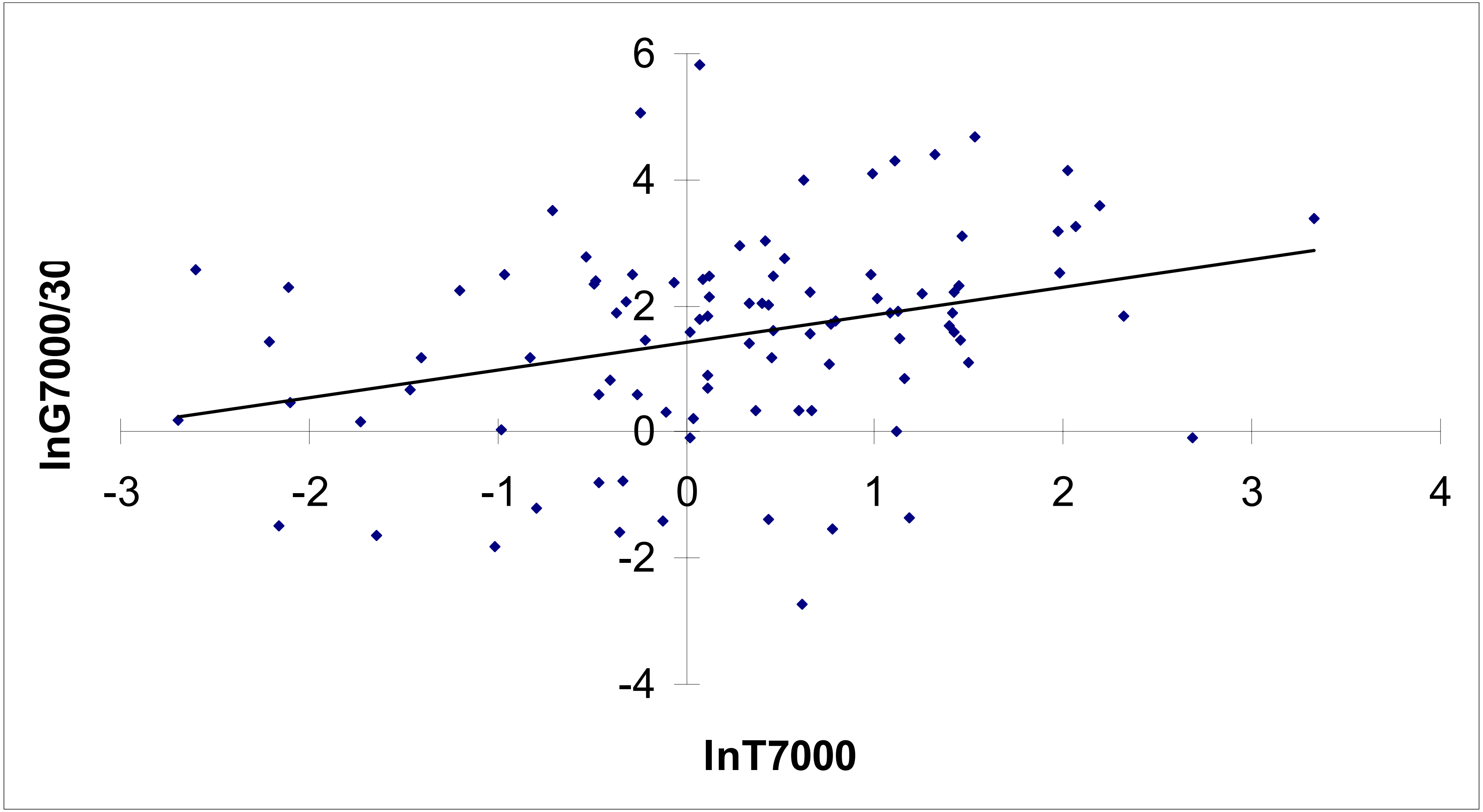

Table 5.2
Testing for the Normal Distribution of the Residuals in A4

Steepness	Kurtosis	Jarque-Bera	P-value
-0.456	3.829	6.066	0.048

Note. The underlying 0-hypothesis of the Jarque-Bera-Test is
the normal distribution of the residuals.

Table 5.3
Testing for Heteroskedasticity in A4

	n*R²	P-value
White-Test	8.114	0.422

Note. The underlying 0-hypothesis of the White-Test is
the constant variance of the residuals (i.e. homoskedasticity).

Table 5.4
Testing for Multicollinearity in A4

	lnY70	lnI7000	lnS7000	lnT7000
lnY70	.			
lnI7000	0.602	.		
lnS7000	0.794	0.746	.	
lnT7000	0.274	0.222	0.342	.

Note. Correlation coefficients.

Table 5.5
Tourism and Economic Growth - Indirect Effects

Estimations:	B1	B2
	Dependent variables	
Independent variables	lnI7000	lnS7000
Constant	2.626	3.653
	(46.01)***	(45.13)***
lnT7000	0.106	0.239
	(2.212)**	(3.525)***
R^2	0.049	0.117
Adjusted R^2	0.039	0.107
Number of observations	96	96

Note. Absolute values of the *t* statistics are in parentheses.
The superscripts *,**, and *** following the *t* statistics represent
a 10, 5, and less than 1% significant level, respectively.

Figure 5.2 – Regression B1 – Tourism and Physical Capital

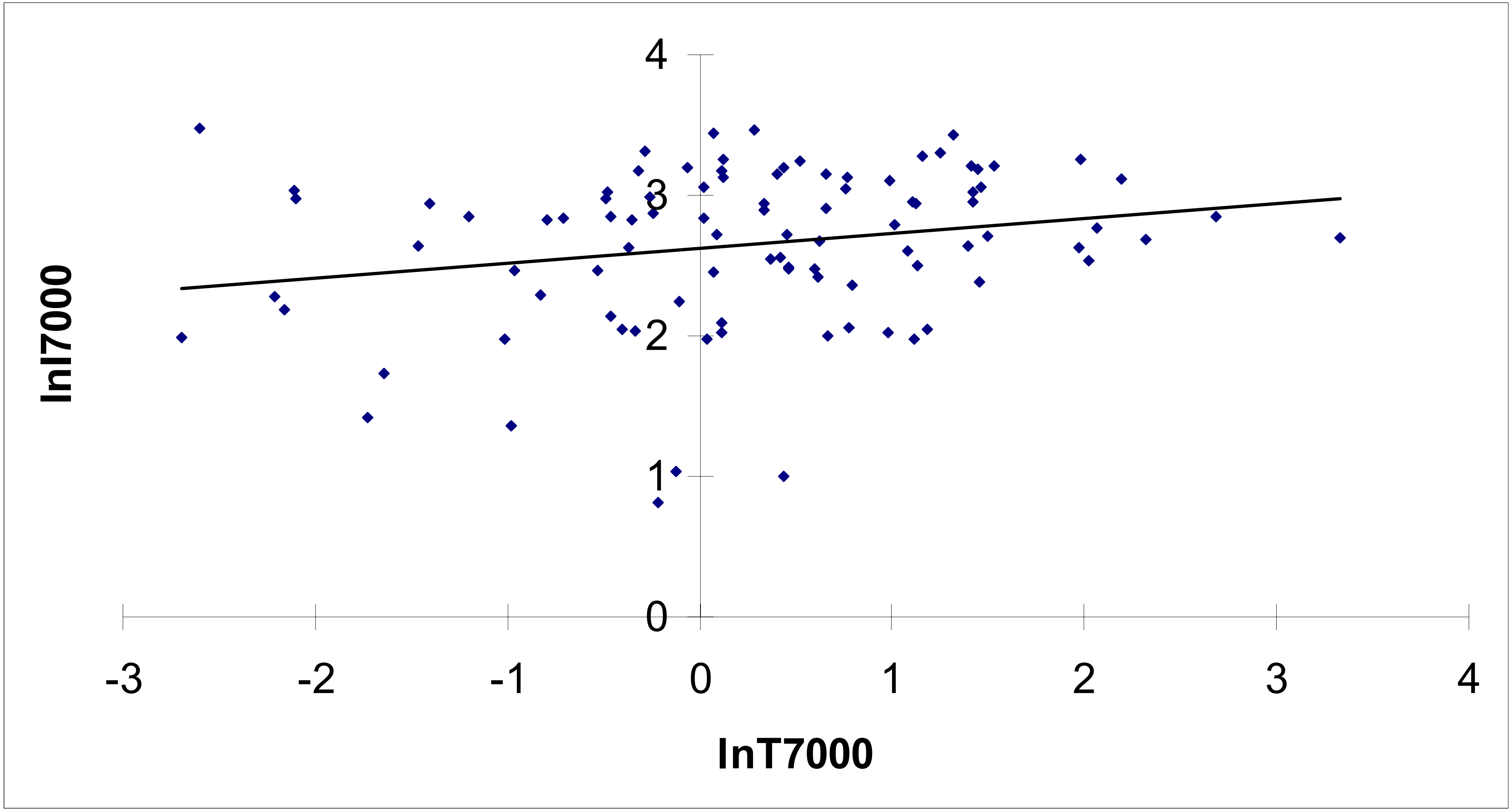

Figure 5.3 – Regression B2 – Tourism and Human Capital

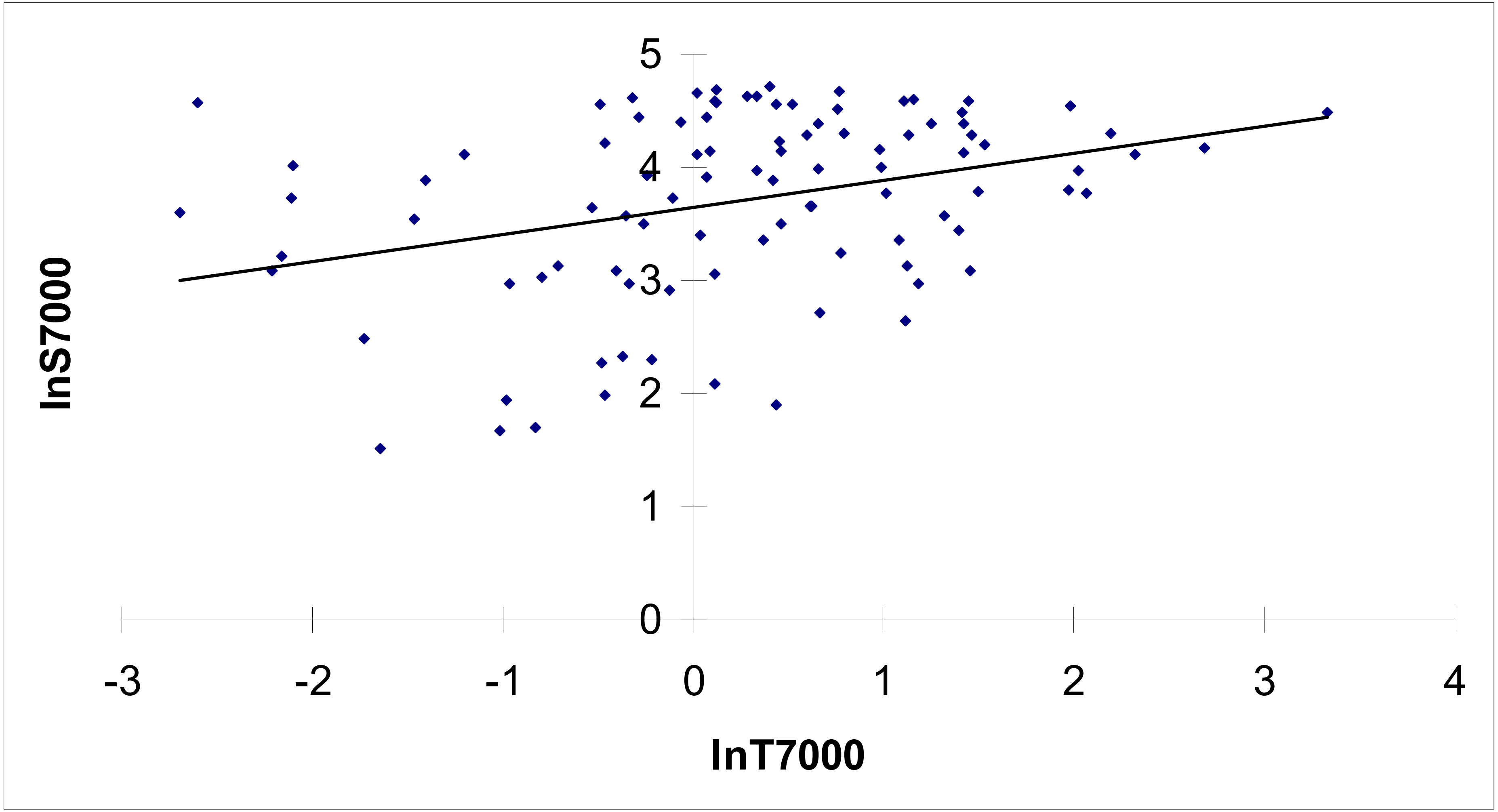

Table 5.6
Tourism and the Real Exchange Rate

Estimations:	C1	C2	C3	C4	C5	C6	C7
	Dependent variables						
Independent variables	lnG7000/30	lnRPL7000	lnRPL7000	lnG7000/30	lnRERD7000	lnG7000/30	lnRERV7000
Constant	1.078	4.021	1.509	4.915	4.587	5.000	2.842
	(0.884)	(78.06)***	(4.827)***	(2.485)**	(137.6)***	(3.664)***	(50.61)***
lnY70	-0.970	-	0.311	-0.985	-	-1.102	-
	(-4.354)***		(8.089)***	(-4.952)***		(-5.828)***	
lnI7000	1.323	-	-	1.342	-	0.919	-
	(3.879)***			(4.078)***		(2.847)***	
lnS7000	1.308	-	-	1.335	-	1.529	-
	(4.320)***			(4.537)***		(5.446)***	
lnRPL7000	-0.022	-	-	-	-	-	-
	(-0.065)						
lnRERD7000	-	-	-	-0.865	-	-	-
				(-2.329)**			
lnRERV7000	-	-	-	-	-	-0.959	-
						(-4.292)***	
lnT7000	-	-0.011	-	-	-0.076	-	-0.108
		(-0.246)			(-2.706)***		(-2.288)**
R^2	0.473	0.001	0.410	0.503	0.072	0.562	0.053
Adjusted R^2	0.450	-0.010	0.404	0.481	0.062	0.543	0.043
No. of observations	96	96	96	96	96	96	96

Note. Absolute values of the *t* statistics are in parentheses. The superscripts *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 5.4 – Regression C3 – Development and RPL

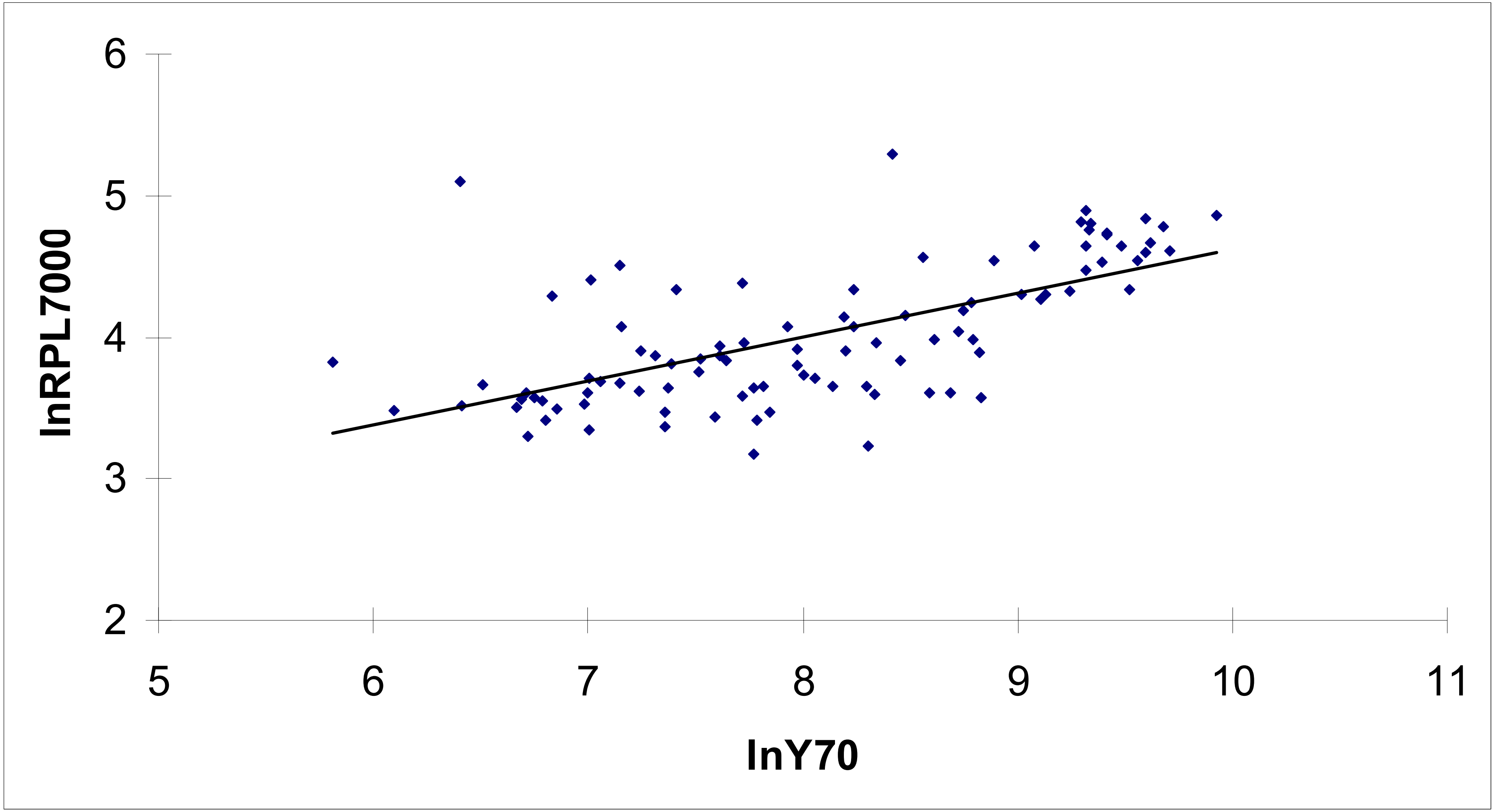

Figure 5.5 – Regression C5 – Tourism and RERD

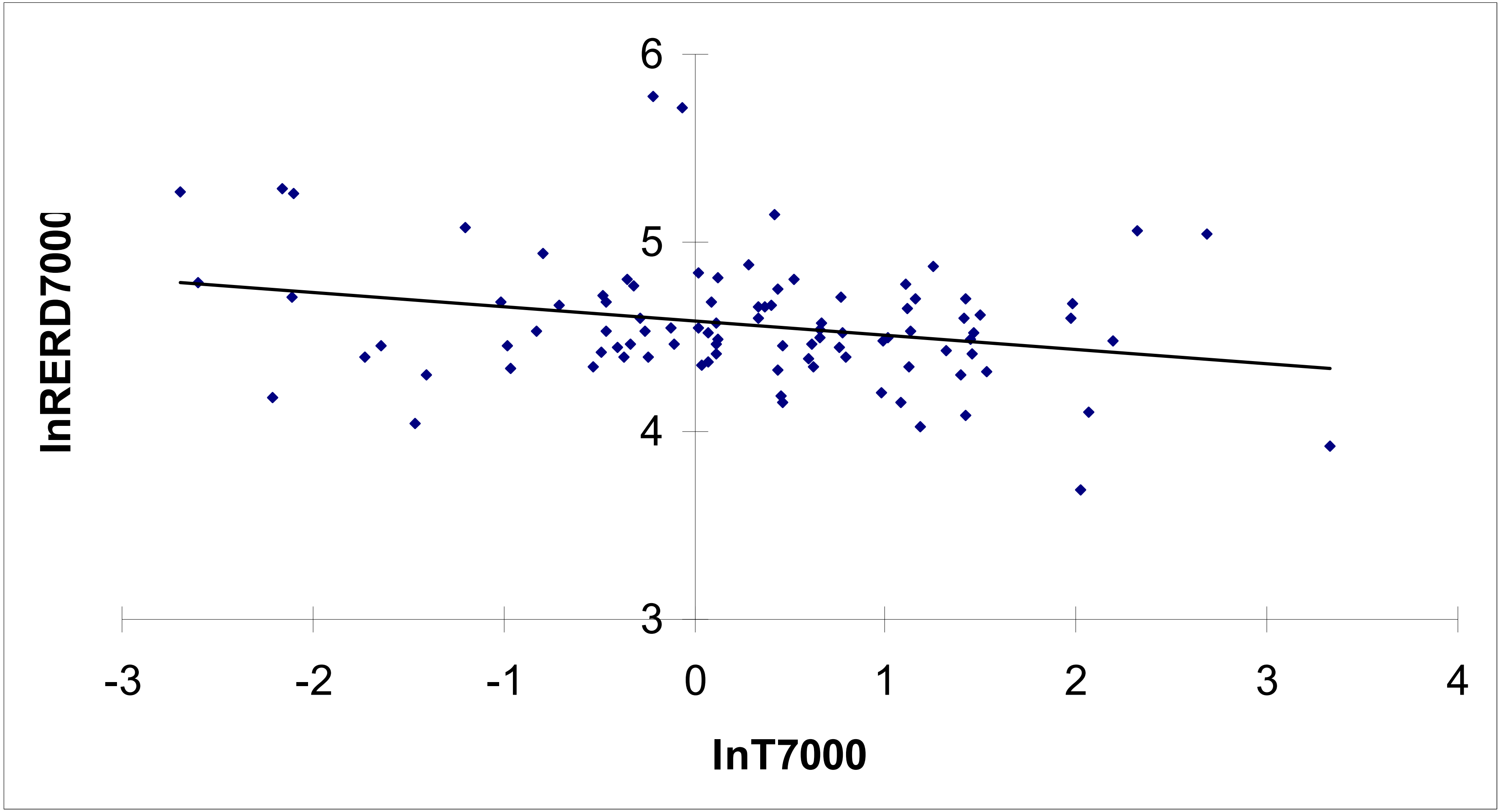

Figure 5.6 – Regression C7 – Tourism and RERV

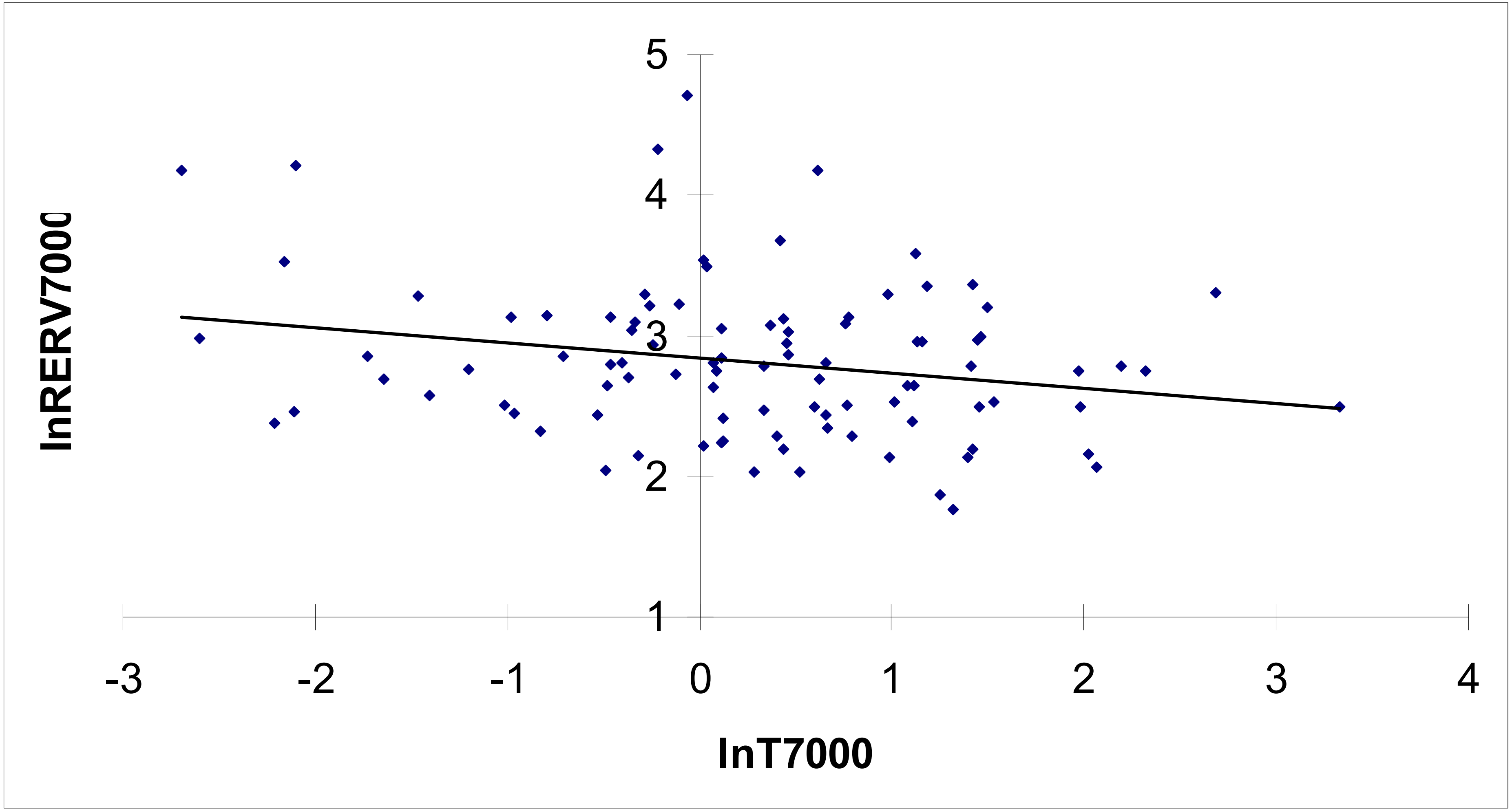

Table 5.7
Tourism and Taxes on Goods and Services

Estimations:	D1	D2
	Dependent variables	
Independent variables	lnG7000/30	lnTX7000
Constant	0.908	1.838
	(0.802)	(29.84)***
lnY70	-1.006	-
	(-4.867)***	
lnI7000	1.268	-
	(3.594)***	
lnS7000	1.353	-
	(4.394)***	
lnTX7000	0.155	-
	(0.717)	
lnT7000	-	0.184
		(3.591)***
R^2	0.470	0.127
Adjusted R^2	0.446	0.117
Number of observations	91	91

Note. Absolute values of the *t* statistics are in parentheses.
The superscripts *,**, and *** following the *t* statistics represent
a 10, 5, and less than 1% significant level, respectively.

Figure 5.7 – Regression D2 – Tourism and Taxes on Goods and Services

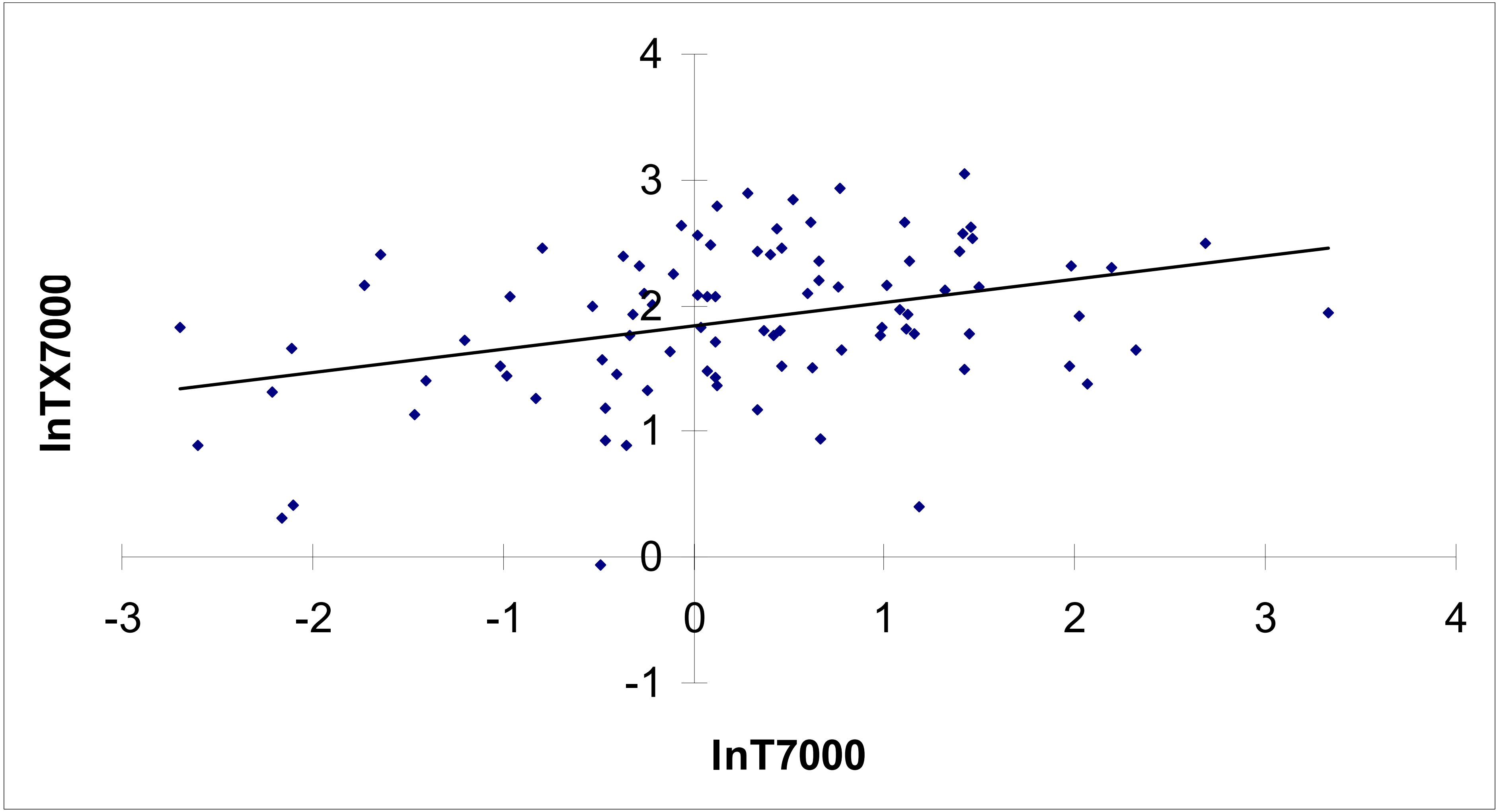

Table 5.8
Tourism and Manufacturing Value Added

Estimations:	E1	E2
	Dependent variables	
Independent variables	lnG7000/30	lnMV7000
Constant	0.346	2.703
	(0.285)	(57.91)***
lnY70	-1.016	-
	(-4.799)***	
lnI7000	1.266	-
	(3.655)***	
lnS7000	1.239	-
	(4.050)***	
lnMV7000	0.529	-
	(1.495)	
lnT7000	-	0.069
		(1.759)*
R^2	0.492	0.033
Adjusted R^2	0.469	0.022
Number of observations	93	93

Note. Absolute values of the *t* statistics are in parentheses.
The superscripts *,**, and *** following the t statistics represent
a 10, 5, and less than 1% significant level, respectively.

Figure 5.8 – Regression E2 – Tourism and Manufacturing Value Added

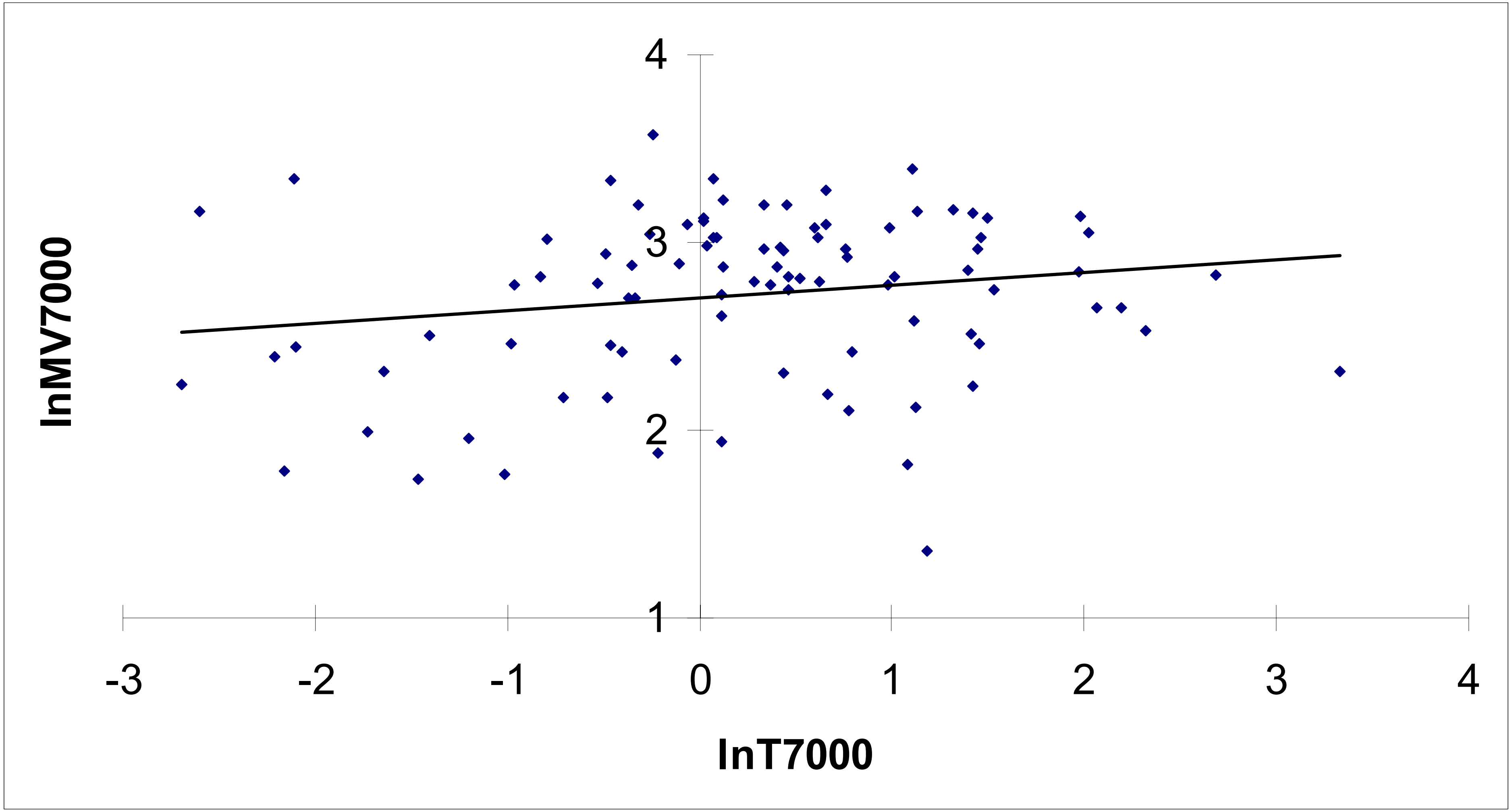

Table 5.9
Tourism and Manufacturing Trade I

Estimations:	F1	F2	F3	F4
	Dependent variables			
Independent variables	lnG8000/20	lnMX8000	lnG8000/20	lnMM8000
Constant	2.611 (1.997)**	1.361 (10.84)***	0.522 (0.339)	2.739 (62.65)***
lnY80	-1.161 (-4.704)***	-	-1.118 (-4.237)***	-
lnI8000	1.585 (3.874)***	-	1.894 (4.456)***	-
lnS8000	0.880 (2.348)**	-	1.227 (3.177)***	-
lnMX8000	0.509 (3.513)***	-	-	-
lnMM8000	-	-	0.138 (0.455)	-
lnT8000	-	0.475 (4.959)***	-	0.223 (6.689)***
R^2	0.471	0.206	0.401	0.320
Adjusted R^2	0.448	0.197	0.375	0.313
Number of observations	97	97	97	97

Note. Absolute values of the *t* statistics are in parentheses. The superscripts *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Figure 5.9 – Regression F2 – Tourism and Manufacturing Exports

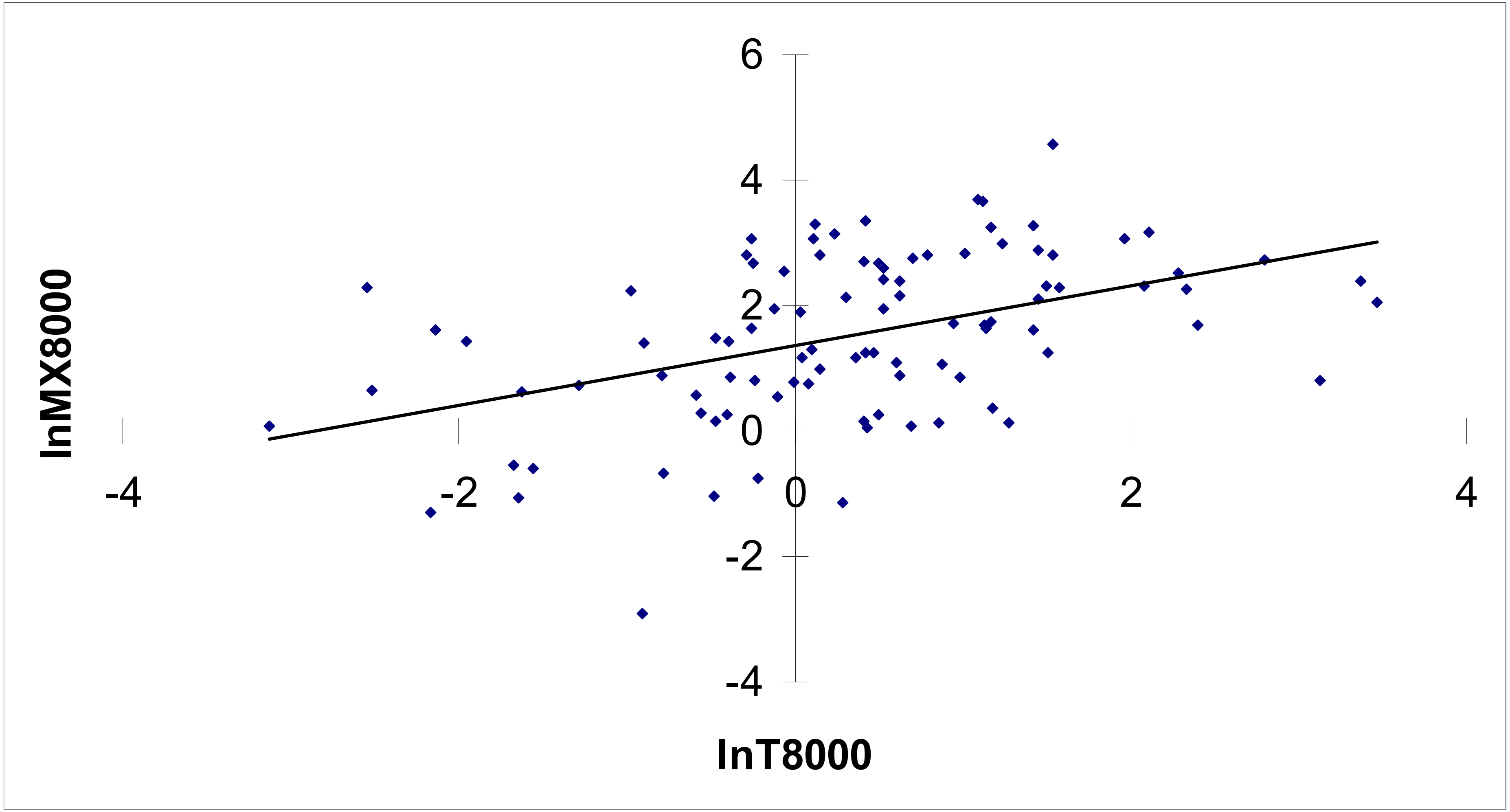

Figure 5.10 – Regression F4 – Tourism and Manufacturing Imports

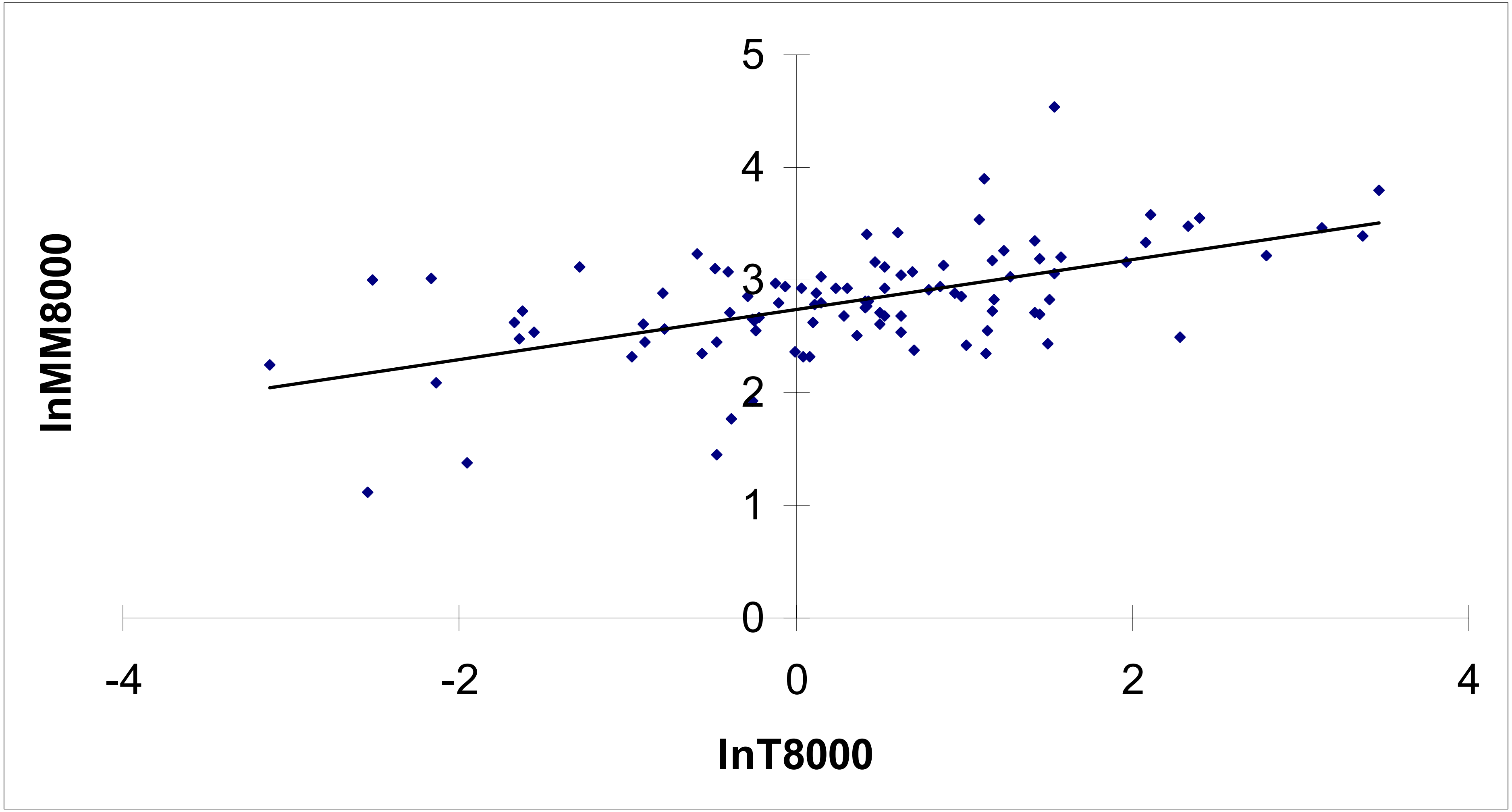

Table 5.10
Tourism and Manufacturing Trade II

Estimations:	G1	G2	G3
	Dependent variables		
Independent variables	lnG8000/20	lnG8000/20	lnMXXGS8000
Constant	1.132 (0.804)	1.554 (1.190)	2.609 (11.38)***
lnY80	-1.109 (-4.312)***	-1.216 (-5.087)***	-
lnI8000	1.954 (4.581)***	1.597 (3.953)***	-
lnS8000	1.244 (3.251)***	0.988 (2.751)***	-
lnXGSY8000	-0.161 (-0.536)	0.015 (0.052)	-
lnMXXGS8000	-	0.622 (4.120)***	-
lnTXGS8000	-	-	0.156 (1.425)
R^2	0.404	0.496	0.020
Adjusted R^2	0.379	0.469	0.010
Number of observations	99	99	99

Note. Absolute values of the *t* statistics are in parentheses.
The superscripts *,**, and *** following the t statistics represent
a 10, 5, and less than 1% significant level, respectively.

Figure 5.11 – Regression G3 – Tourism and Manufacturing Exports

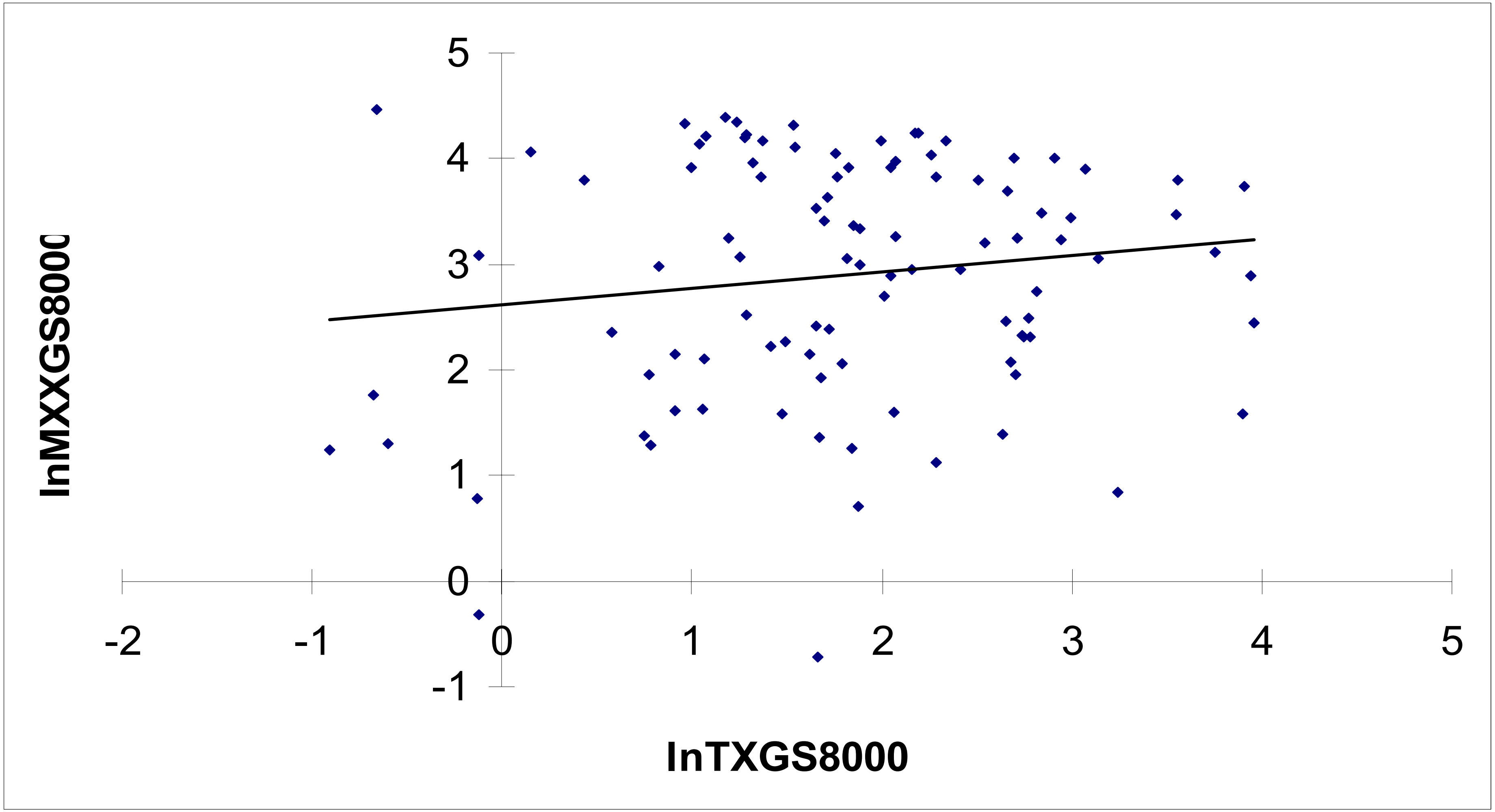

Table 6.1
Panel Unit Root Test for Levels

Variable	Period	No.of countries	P-value
y	1970-2000	100	0.526
k	1970-2000	98	1.000
h	1980-1996	113	0.147
x	1977-2000	71	0.000

Note. The Im-Pesaran-Shin panel unit root test assumes that all series are non-stationary under the null hypothesis.

Table 6.2
Panel Unit Root Test for First Differences

Variable	Period	No.of countries	P-value
dy	1971-2000	100	0.000
dk	1971-2000	98	0.003
dh	1981-1996	113	0.000
dx	1978-2000	71	0.000

Note. The Im-Pesaran-Shin panel unit root test assumes that all series are non-stationary under the null hypothesis.

Table 6.3
The Impact of Physical and Human Capital on Output

Estimations:	H1	H2	H3
Specification:	Fixed Effects	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:			2 lags, 1 lead
	Dependent variables		
Independent variables	y	y	y
Constant	1.374	1.955	1.957
	(13.36)***	(14.73)***	(11.25)***
k	0.732	0.684	0.693
	(62.07)***	(60.54)***	(46.28)***
h	0.128	0.006	-0.011
	(16.47)***	(0.61)	(-0.76)
R^2 within	0.652	0.693	0.676
R^2 between	0.959	0.956	0.956
R^2 overall	0.951	0.948	0.952
Countries	109	109	107
Average T	23.4	23.4	17.6
Number of observations	2552	2552	1878

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table 6.4
Tourism and Output

Estimations:	I1	I2	I3
Specification:	Fixed Effects	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:			2 lags, 1 lead
	Dependent variables		
Independent variables	y	y	y
Constant	1.583 (13.62)***	2.259 (18.05)***	2.506 (16.38)***
k	0.707 (53.30)***	0.660 (49.77)***	0.657 (41.71)***
h	0.112 (11.26)***	0.123 (1.04)	0.003 (0.20)
x	0.033 (8.95)***	0.018 (4.90)***	0.030 (5.29)***
R^2 within	0.661	0.696	0.719
R^2 between	0.960	0.962	0.962
R^2 overall	0.959	0.959	0.965
Countries	100	100	95
Average T	20.1	20.1	16.0
Number of observations	2008	2008	1520

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table 6.5
Trans-Log Production Function

Estimations:	J1	J2
Specification:	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:	2 lags, 1 lead	2 lags, 1 lead
	Dependent variables	
Independent variables	y	y
Constant	3.978	5.240
	(7.99)***	(9.38)***
k	0.279	0.133
	(2.47)**	(1.0)
h	-0.141	-0.280
	(-1.72)*	(2.84)***
x	-	0.126
		(3.65)***
k^2	0.019	0.017
	(2.48)**	(1.86)*
h^2	-0.003	-0.022
	(-0.35)	(-2.04)**
x^2	-	0.002
		(1.43)
kh	0.019	0.053
	(1.36)	(3.12)***
kx	-	-0.021
		(-4.59)***
hx	-	0.025
		(3.49)***
R^2 within	0.680	0.731
R^2 between	0.957	0.964
R^2 overall	0.953	0.963
Countries	107	95
Average T	17.6	16.0
Number of observations	1878	1520

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table 6.6
Tourism and Real Exchange Rate Distortion

Estimations:	K1	K2
Specification:	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:	2 lags, 1 lead	2 lags, 1 lead
	Dependent variables	
Independent variables	y	rerd
Constant	2.485 (14.68)***	4.487 (82.53)***
k	0.706 (49.57)***	-
h	-0.022 (-1.61)	-
rerd	-0.137 (-13.59)***	-
x	-	-0.168 (-15.24)***
R^2 within	0.710	0.198
R^2 between	0.958	0.000
R^2 overall	0.954	0.043
Countries	107	129
Average T	17.6	18.0
Number of observations	1878	2325

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table 6.7
Tourism and Manufacturing

Estimations:	L1	L2
Specification:	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:	2 lags, 1 lead	2 lags, 1 lead
	Dependent variables	
Independent variables	y	mv
Constant	1.918 (10.51)***	2.659 (45.83)***
k	0.676 (41.67)***	-
h	0.018 (1.14)	-
mv	0.032 (1.80)*	-
x	-	0.022 (2.37)**
R^2 within	0.682	0.028
R^2 between	0.955	0.002
R^2 overall	0.949	0.000
Countries	101	128
Average T	14.7	16.0
Number of observations	1482	2050

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table 6.8
Real Exchange Rate and Manufacturing

Estimations:	M1	M2
Specification:	Fixed Effects Time Dummies	Fixed Effects Time Dummies
Short-run dynamics:	2 lags, 1 lead	2 lags, 1 lead
	Dependent variables	
Independent variables	y	mv
Constant	2.842 (16.74)***	-
k	0.665 (41.51)***	-
h	0.020 (1.23)	-
x	0.013 (1.88)*	-
rerd	-0.104 (-7.54)***	-0.029 (-1.65)*
mv	-0.002 (-0.10)	-
R^2 within	0.745	0.037
R^2 between	0.964	0.067
R^2 overall	0.962	0.000
Countries	89	145
Average T	13.8	19.0
Number of observations	1224	2756

Note. Absolute values of the *t* statistics are in parentheses. The superscrites *,**, and *** following the *t* statistics represent a 10, 5, and less than 1% significant level, respectively.

Table A
Descriptive Statistics I

	G7000/30	Y70	I7000	S7000	T7000
	%	USD	%	%	%
Average	2.6	5035	16.1	53.1	2.4
Algeria	1.4	3428	19.0	48.5	0.2
Argentina	0.6	9227	17.3	67.2	0.6
Australia	2.5	14708	23.8	98.7	1.1
Austria	3.8	11122	26.0	93.8	7.3
Bangladesh	1.8	1100	9.8	22.0	0.1
Barbados	5.9	5927	14.8	88.5	27.9
Benin	0.3	1099	7.4	15.2	1.9
Bolivia	0.3	2482	9.4	41.3	0.9
Brazil	3.3	3600	20.7	41.4	0.1
Burkina Faso	1.4	673	9.9	5.5	0.4
Burundi	-1.3	856	5.7	4.5	0.2
Cameroon	0.9	1590	7.8	21.8	0.7
Canada	3.0	14198	22.8	96.9	1.1
Cape Verde	6.2	1406	17.1	22.8	0.5
Chad	-0.7	1157	8.4	7.2	0.6
Chile	3.5	4805	15.1	62.7	1.1
China	11.9	820	17.8	51.2	0.8
Colombia	2.3	3158	11.6	50.1	1.1
Comoros	-1.1	2364	7.8	19.6	3.3
Congo, Republic of	3.2	925	17.3	61.4	0.3
Costa Rica	1.3	4210	15.1	44.3	4.5
Cote d'Ivoire	-0.7	2365	7.6	19.5	0.7
Denmark	2.2	15911	22.9	106.5	2.2
Dominican Republic	5.3	2031	13.8	44.7	7.2
Ecuador	1.7	2274	18.9	53.0	1.4
Egypt	3.7	1977	7.6	63.5	2.7
El Salvador	0.2	4149	7.2	30.0	1.0
Ethiopia	0.2	607	4.1	12.0	0.2
Finland	3.7	11312	26.0	108.6	1.1
France	2.8	12239	24.6	95.0	1.5
Gabon	0.8	6852	14.0	34.8	0.2
Germany	2.9	12281	23.8	100.5	0.7
Ghana	0.2	1275	7.3	36.8	0.1
Greece	2.6	8273	24.7	88.8	4.1
Guatemala	1.0	2991	8.1	21.2	1.1
Guinea-Bissau	3.5	334	20.6	9.7	0.6
Honduras	0.4	1854	12.7	28.6	1.4
Hong Kong	10.3	6540	24.9	67.0	4.6
Hungary	3.1	5372	19.1	80.0	4.1
Iceland	4.3	10857	25.8	95.3	1.7
India	4.3	1077	11.8	38.3	0.6
Indonesia	7.7	1097	14.6	38.6	1.9
Iran	0.5	5210	19.7	55.0	0.1
Ireland	8.8	7275	19.2	98.7	3.0
Israel	3.1	8744	27.1	80.2	3.5
Italy	3.2	11172	23.3	80.2	1.9
Jamaica	-0.1	3786	17.3	64.5	14.6
Japan	3.9	11396	32.2	96.3	0.1
Jordan	2.4	2248	14.6	61.0	10.2

	G7000/30 %	Y70 USD	I7000 %	S7000 %	T7000 %
Kenya	1.8	804	10.8	22.0	4.3
Korea, Republic of	15.7	2777	31.1	84.6	1.1
Lesotho	2.6	901	18.9	23.0	3.1
Luxembourg	6.4	15011	22.5	74.1	9.0
Madagascar	-1.1	1275	2.8	18.5	0.9
Malawi	2.5	445	13.8	10.2	0.7
Malaysia	8.0	2910	22.3	54.6	2.7
Mali	0.8	787	7.5	8.0	1.1
Mauritius	8.2	4027	12.6	53.3	7.5
Mexico	2.0	5513	18.2	53.7	1.9
Morocco	2.2	2245	13.9	31.4	4.0
Mozambique	-1.1	1571	2.7	6.7	1.5
Nepal	2.6	826	13.5	28.8	2.9
Netherlands	2.8	13182	23.4	111.9	1.5
New Zealand	1.3	13681	21.1	91.6	2.1
Nicaragua	-1.9	4008	11.3	38.9	1.9
Niger	-1.4	1504	7.3	5.3	0.4
Nigeria	-1.2	1113	8.9	24.8	0.1
Norway	4.8	11136	31.8	102.5	1.3
Pakistan	3.7	945	11.7	19.5	0.4
Panama	2.0	3785	20.7	62.2	4.1
Paraguay	2.1	2896	12.1	33.0	1.6
Peru	-0.1	4705	17.0	60.9	1.0
Philippines	1.4	2401	15.2	68.3	1.6
Poland	3.5	4535	24.4	82.0	0.9
Portugal	5.1	6289	21.3	73.0	4.3
Romania	3.7	2024	27.5	84.6	0.8
Rwanda	0.0	889	3.9	7.0	0.4
Senegal	0.0	1621	7.2	14.0	3.1
South Africa	0.4	6798	12.0	73.1	1.8
Spain	3.3	9034	24.2	98.3	4.2
Sri Lanka	3.7	1568	11.9	62.9	1.6
Sweden	2.0	14757	21.3	105.1	1.0
Switzerland	1.0	20424	26.6	99.6	3.2
Syria	4.9	1648	12.9	48.4	1.5
Thailand	9.1	1836	30.9	35.6	3.7
Togo	-1.2	1386	7.8	25.6	2.2
Trinidad &Tobago	2.3	6569	10.6	73.3	2.2
Tunisia	5.5	2550	16.0	43.3	7.9
Turkey	3.0	3625	16.2	43.6	2.7
Uganda	1.8	605	2.3	10.0	0.8
United Kingdom	2.8	12030	18.1	101.8	1.4
Uruguay	1.9	6156	12.1	72.6	3.1
USA	3.4	16488	19.7	95.8	0.6
Venezuela	-1.3	10342	16.8	35.7	0.7
Zambia	-1.0	1283	16.9	20.7	0.5
Zimbabwe	0.6	2087	19.9	33.0	0.8
Average	2.6	5035	16.1	53.1	2.4

Note. G7000/30 is the real growth rate of GDP per capita at PPP per annum between 1970 and 2000. Y70 is the GDP per capita in USD at PPP in the year 1970. I7000 is the investment share in GDP per capita at PPP, averaged 1970-2000. S7000 is the gross secondary school enrolment ratio, averaged 1970-2000. T7000 is the share of travel income in GDP, averaged 1970-2000.

Table B
Descriptive Statistics II

	T7000	TX7000	MV7000	N31S7000	N31T7000	N31TX7000	N31MV7000
	%	%	%	No.	No.	No.	No.
Average	2.4	7.7	16.6	23.8	23.4	20.7	24.0
Algeria	0.2	4.1	12.2	26	15	7	31
Argentina	0.6	3.3	28.0	25	25	31	31
Australia	1.1	5.6	13.6	26	31	28	12
Austria	7.3	10.2	23.2	27	31	29	25
Bangladesh	0.1	3.7	10.9	25	25	18	31
Barbados	27.9	7.0	10.1	23	31	18	31
Benin	1.9	2.5	8.9	23	27	9	30
Bolivia	0.9	9.5	17.9	24	25	11	11
Brazil	0.1	5.3	28.1	26	26	21	30
Burkina Faso	0.4	3.5	16.7	26	21	21	31
Burundi	0.2	11.1	10.1	25	12	23	30
Cameroon	0.7	4.3	11.2	24	19	23	31
Canada	1.1	3.9	17.7	26	31	27	18
Cape Verde	0.5	-	9	19	12	0	15
Chad	0.6	2.5	11.6	18	15	11	27
Chile	1.1	12.0	20.6	24	26	29	31
China	0.8	3.8	35.8	25	19	10	31
Colombia	1.1	4.4	20.7	25	31	29	31
Comoros	3.3	1.5	3.9	17	13	6	21
Congo, Republic of	0.3	5.6	7.1	19	20	20	23
Costa Rica	4.5	8.5	23.0	25	24	29	31
Cote d'Ivoire	0.7	5.9	14.9	26	26	15	31
Denmark	2.2	18.9	18.6	26	24	31	30
Dominican Rep.	7.2	4.6	17.2	21	31	29	31
Ecuador	1.4	3.2	19.4	24	25	22	31
Egypt	2.7	5.9	16.1	26	24	23	27
El Salvador	1.0	6.2	19.8	23	25	4	31
Ethiopia	0.2	8.7	7.3	26	22	15	20
Finland	1.1	16.3	25.3	27	26	27	26
France	1.5	13.7	19.3	27	26	26	11
Gabon	0.2	3.1	5.7	4	22	13	31
Germany	0.7	6.9	24.4	11	30	28	10
Ghana	0.1	6.3	9.4	26	23	22	31
Greece	4.1	13.1	12.4	27	24	27	6
Guatemala	1.1	4.2	15.2	25	24	11	31
Guinea-Bissau	0.6	4.8	8.8	19	2	6	16
Honduras	1.4	6.0	16.1	18	27	12	31
Hong Kong	4.6	-	16	21	3	0	21
Hungary	4.1	21.0	23.4	23	19	18	8
Iceland	1.7	17.1	16.5	26	25	25	8
India	0.6	7.3	16.1	26	26	27	31
Indonesia	1.9	4.5	16.3	25	20	28	31
Iran	0.1	1.5	11.5	24	25	27	27
Ireland	3.0	14.3	29.6	24	27	27	11
Israel	3.5	-	-	27	31	0	0
Italy	1.9	10.5	26.5	27	31	27	30
Jamaica	14.6	12.2	16.9	26	25	19	31
Japan	0.1	2.4	23.6	27	18	24	11
Jordan	10.2	5.2	12.6	11	29	27	31

Kenya	4.3	13.8	11.7	26	26	27	31
Korea, Republic of	1.1	8.0	28.1	26	25	28	31
Lesotho	3.1	6.9	8.3	26	26	24	31
Luxembourg	9.0	10.0	14.2	16	6	27	6
Madagascar	0.9	5.2	10.8	16	27	20	17
Malawi	0.7	10.9	15.0	23	18	20	26
Malaysia	2.7	6.2	21.8	26	27	26	31
Mali	1.1	8.0	6.9	23	23	14	31
Mauritius	7.5	6.8	21.1	26	25	24	24
Mexico	1.9	9.1	22.1	27	22	29	31
Morocco	4.0	11.3	17.4	26	26	29	31
Mozambique	1.5	-	10	23	1	0	11
Nepal	2.9	7.1	6.2	26	25	29	31
Netherlands	1.5	11.2	17.7	27	31	25	5
New Zealand	2.1	8.6	19.3	26	29	25	11
Nicaragua	1.9	14.3	20.7	25	24	28	29
Niger	0.4	4.6	5.8	25	22	5	31
Nigeria	0.1	1.4	5.9	23	23	11	31
Norway	1.3	18.0	16.3	27	26	28	27
Pakistan	0.4	7.9	16.1	24	25	27	31
Panama	4.1	4.5	9.3	26	24	15	21
Paraguay	1.6	4.6	15.6	26	26	29	31
Peru	1.0	8.1	22.8	24	24	31	31
Philippines	1.6	6.1	24.6	25	24	29	31
Poland	0.9	13.9	22.0	25	21	11	7
Portugal	4.3	12.6	20.6	26	26	26	13
Romania	0.8	10.1	-	27	21	12	0
Rwanda	0.4	4.3	11.7	25	24	12	31
Senegal	3.1	6.1	13.3	25	26	20	22
South Africa	1.8	8.2	21.7	16	31	29	31
Spain	4.2	5.9	19.4	27	26	27	5
Sri Lanka	1.6	11.6	16.7	24	26	30	31
Sweden	1.0	12.9	22.5	27	31	29	2
Switzerland	3.2	5.9	-	11	24	2	0
Syria	1.5	5.8	19.5	25	24	24	11
Thailand	3.7	8.4	23.9	25	26	29	31
Togo	2.2	5.2	8.2	26	27	11	31
Trinidad &Tobago	2.2	-	11	25	24	0	31
Tunisia	7.9	3.9	14.1	27	25	9	31
Turkey	2.7	8.7	16.7	25	14	29	31
Uganda	0.8	7.4	6.6	26	6	18	31
United Kingdom	1.4	11.4	24.6	27	31	29	30
Uruguay	3.1	10.6	23.6	24	23	29	30
USA	0.6	0.9	18.9	19	31	29	14
Venezuela	0.7	2.4	17.7	26	31	31	31
Zambia	0.5	11.7	20.5	26	15	17	31
Zimbabwe	0.8	8.1	20.9	25	18	22	31
	T7000	TX7000	MV7000	N31S7000	N31T7000	N31TX7000	N31MV7000
	%	%	%	No.	No.	No.	No.
Average	2.4	7.7	16.6	23.8	23.4	20.7	24.0

Note. T7000 is the share of travel income in GDP, averaged 1970-2000. TX7000 is the share of taxes on goods and services in % of the value added of industry and services, averaged 1970-2000. MV7000 is the share of manufacturing value added in GDP, averaged 1970-2000. N31S7000, N31T7000, N31TX7000 and N31MV7000 give the number of years that were available for calculating the respective variables.

Table C
Descriptive Statistics III

	G7000/30	Y70	T7000	RPL7000	RERD7000	RERV7000
	%	USD	%	%	%	%
Average	2.6	5035	2.4	63.0	102.2	19.9
Algeria	1.4	3428	0.2	38.4	73.8	13.2
Argentina	0.6	9227	0.6	73.8	107.9	23.0
Australia	2.5	14708	1.1	98.8	96.9	9.4
Austria	3.8	11122	7.3	103.8	107.6	12.2
Bangladesh	1.8	1100	0.1	28.3	65.3	10.8
Barbados	5.9	5927	27.9	37.0	50.2	12.2
Benin	0.3	1099	1.9	40.8	96.8	10.5
Bolivia	0.3	2482	0.9	38.6	86.2	25.3
Brazil	3.3	3600	0.1	63.2	111.3	11.7
Burkina Faso	1.4	673	0.4	39.1	92.8	10.2
Burundi	-1.3	856	0.2	35.8	86.0	14.8
Cameroon	0.9	1590	0.7	38.0	85.0	16.6
Canada	3.0	14198	1.1	94.1	88.5	9.6
Cape Verde	6.2	1406	0.5	49.7	106.1	17.4
Chad	-0.7	1157	0.6	39.7	92.7	16.5
Chile	3.5	4805	1.1	63.3	108.4	15.6
China	11.9	820	0.8	36.9	80.5	18.9
Colombia	2.3	3158	1.1	40.8	78.8	16.5
Comoros	-1.1	2364	3.3	23.9	55.9	28.7
Congo, Republic of	3.2	925	0.3	73.3	160.8	15.8
Costa Rica	1.3	4210	4.5	52.4	101.1	24.6
Cote d'Ivoire	-0.7	2365	0.7	38.2	86.4	22.2
Denmark	2.2	15911	2.2	119.9	111.1	12.2
Dominican Republic	5.3	2031	7.2	47.7	99.2	15.7
Ecuador	1.7	2274	1.4	52.2	105.9	16.2
Egypt	3.7	1977	2.7	30.9	66.9	27.0
El Salvador	0.2	4149	1.0	36.6	77.7	32.9
Ethiopia	0.2	607	0.2	33.5	80.8	17.5
Finland	3.7	11312	1.1	116.8	123.4	11.2
France	2.8	12239	1.5	112.0	116.1	9.0
Gabon	0.8	6852	0.2	35.4	57.0	26.5
Germany	2.9	12281	0.7	113.9	117.7	8.5
Ghana	0.2	1275	0.1	91.0	194.9	65.2
Greece	2.6	8273	4.1	73.6	99.0	16.1
Guatemala	1.0	2991	1.1	41.7	86.7	21.2
Guinea-Bissau	3.5	334	0.6	45.7	111.8	14.1
Honduras	0.4	1854	1.4	47.0	105.3	21.6
Hong Kong	10.3	6540	4.6	69.6	74.8	12.6
Hungary	3.1	5372	4.1	36.9	59.2	28.9
Iceland	4.3	10857	1.7	122.9	122.1	7.7
India	4.3	1077	0.6	33.9	76.7	11.4
Indonesia	7.7	1097	1.9	36.8	76.9	14.8
Iran	0.5	5210	0.1	95.6	192.4	67.3
Ireland	8.8	7275	3.0	93.9	118.6	10.9
Israel	3.1	8744	3.5	103.9	130.5	6.5
Italy	3.2	11172	1.9	87.5	93.5	11.5
Jamaica	-0.1	3786	14.6	76.0	155.6	27.3
Japan	3.9	11396	0.1	122.0	120.3	19.6
Jordan	2.4	2248	10.2	80.4	157.7	15.7

Kenya	1.8	804	4.3	35.3	82.3	12.2
Korea, Republic of	15.7	2777	1.1	59.1	92.0	13.9
Lesotho	2.6	901	3.1	30.2	76.8	35.9
Luxembourg	6.4	15011	9.0	106.4	88.1	16.3
Madagascar	-1.1	1275	0.9	39.6	94.7	15.3
Malawi	2.5	445	0.7	32.7	80.6	14.9
Malaysia	8.0	2910	2.7	50.2	88.2	8.5
Mali	0.8	787	1.1	33.4	82.3	17.3
Mauritius	8.2	4027	7.5	25.3	40.0	8.7
Mexico	2.0	5513	1.9	53.4	89.6	16.6
Morocco	2.2	2245	4.0	36.2	73.8	8.4
Mozambique	-1.1	1571	1.5	32.1	75.8	22.7
Nepal	2.6	826	2.9	27.1	63.5	14.1
Netherlands	2.8	13182	1.5	103.9	106.0	9.8
New Zealand	1.3	13681	2.1	76.2	85.4	21.8
Nicaragua	-1.9	4008	1.9	38.6	86.4	64.8
Niger	-1.4	1504	0.4	47.8	108.3	12.2
Nigeria	-1.2	1113	0.1	81.6	197.9	34.0
Norway	4.8	11136	1.3	134.2	131.7	7.7
Pakistan	3.7	945	0.4	32.9	75.9	11.6
Panama	2.0	3785	4.1	59.0	109.9	9.0
Paraguay	2.1	2896	1.6	44.8	86.0	17.6
Peru	-0.1	4705	1.0	46.3	94.0	34.4
Philippines	1.4	2401	1.6	30.4	65.9	19.0
Poland	3.5	4535	0.9	199.1	304.9	111.0
Portugal	5.1	6289	4.3	66.1	92.2	20.0
Romania	3.7	2024	0.8	51.5	99.4	27.1
Rwanda	0.0	889	0.4	34.7	85.8	23.0
Senegal	0.0	1621	3.1	45.4	105.0	14.1
South Africa	0.4	6798	1.8	48.9	80.3	12.2
Spain	3.3	9034	4.2	71.4	89.1	19.6
Sri Lanka	3.7	1568	1.6	29.1	63.5	20.6
Sweden	2.0	14757	1.0	126.8	126.0	9.2
Switzerland	1.0	20424	3.2	129.8	109.8	19.2
Syria	4.9	1648	1.5	76.4	171.6	39.6
Thailand	9.1	1836	3.7	42.7	83.8	5.8
Togo	-1.2	1386	2.2	37.4	91.8	23.0
Trinidad &Tobago	2.3	6569	2.2	53.9	80.6	9.8
Tunisia	5.5	2550	7.9	32.3	60.6	7.9
Turkey	3.0	3625	2.7	49.4	89.7	12.6
Uganda	1.8	605	0.8	164.8	322.4	76.1
United Kingdom	2.8	12030	1.4	92.4	99.8	11.8
Uruguay	1.9	6156	3.1	57.0	92.9	19.3
USA	3.4	16488	0.6	100.0	83.0	7.7
Venezuela	-1.3	10342	0.7	75.6	122.6	21.0
Zambia	-1.0	1283	0.5	58.8	139.8	23.3
Zimbabwe	0.6	2087	0.8	46.1	93.0	25.0
	G7000/30	Y70	T7000	RPL7000	RERD7000	RERV7000
	%	USD	%	%	%	%
Average	2.6	5035	2.4	63.0	102.2	19.9

Note. G7000/30 is the real growth rate of GDP per capita at PPP per annum between 1970 and 2000. Y70 is the GDP per capita in USD at PPP in the year 1970. T7000 is the share of travel income in GDP, averaged 1970-2000. RPL7000 is the relative price level index with respect to the USA, averaged 1970-2000. RERD7000 is the real ex. rate distortion index, averaged 1970-2000. RERV7000 is the real exchange rate variability, averaged 1970-2000.

Table D
Descriptive Statistics IV

	G8000/20	Y80	I8000	S8000	MX8000	MM8000	T8000
	%	USD	%	%	%	%	%
Average	1.9	6283	15.3	56.8	9.4	18.9	3.1
Algeria	0.2	4745	16.6	56.0	0.6	12.6	0.2
Argentina	0.2	10556	15.8	71.5	2.3	5.9	0.7
Australia	2.5	17092	23.2	102.4	3.2	12.2	1.4
Austria	2.5	15706	25.1	99.7	21.5	23.5	7.1
Bangladesh	3.7	967	10.4	22.5	5.0	8.1	0.1
Barbados	3.2	10024	11.4	92.1	11.0	29.8	29.0
Belize	2.0	4695	14.5	49.1	5.5	35.1	11.1
Benin	1.1	996	8.0	16.8	1.2	19.1	2.4
Bolivia	-0.5	3046	8.4	43.8	1.7	16.3	0.9
Brazil	0.7	6327	18.0	46.5	4.2	4.0	0.1
Burkina Faso	1.2	769	10.3	6.6	0.5	13.0	0.5
Burundi	-1.5	756	6.9	5.2	0.3	12.0	0.2
Cameroon	-0.2	2125	8.0	24.3	1.2	11.6	0.6
Canada	2.1	19022	24.1	100.4	16.7	20.7	1.2
Cape Verde	5.3	1963	17.6	23.6	1.8	25.3	0.6
Chad	-2.2	1622	6.3	8.2	1.3	10.4	0.6
Chile	4.2	5418	17.3	67.3	2.7	16.4	1.2
China	12.5	1072	19.2	50.3	14.5	13.9	0.8
Colombia	1.2	4314	11.8	52.7	3.3	10.2	1.0
Comoros	-1.2	2067	7.8	21.5	1.4	17.0	3.3
Congo, Republic of	0.8	1554	13.0	62.9	2.1	22.7	0.3
Costa Rica	0.4	5413	15.3	45.2	9.8	24.7	4.8
Cote d'Ivoire	-1.3	2498	5.7	21.1	4.2	15.0	0.7
Denmark	2.3	18282	21.3	112.4	16.5	18.3	2.2
Dominican Rep.	4.0	2916	13.3	47.4	12.5	12.0	9.8
Ecuador	-0.9	4191	16.5	55.3	1.2	15.7	1.5
Egypt	3.6	2419	7.4	69.1	2.3	17.4	2.7
El Salvador	0.3	4160	7.1	32.5	6.6	18.7	1.0
Ethiopia	0.0	641	4.2	13.4	0.6	13.7	0.2
Finland	2.7	15484	24.3	112.6	21.5	16.2	1.1
France	1.9	16201	23.8	98.9	14.5	13.6	1.7
Gabon	-0.3	9027	11.5	57.0	1.9	15.3	0.2
Germany	2.2	15841	23.1	101.8	21.2	14.1	0.8
Ghana	0.6	1204	6.1	38.0	1.9	20.1	0.1
Greece	1.2	11767	21.1	92.1	5.0	15.0	4.1
Grenada	5.2	3039	20.7	62.8	2.2	32.1	22.9
Guatemala	-0.2	4053	7.4	23.9	3.6	13.9	1.1
Guinea-Bissau	2.6	453	18.7	10.2	0.4	22.1	0.6
Honduras	-0.5	2272	12.9	32.7	3.5	23.5	1.6
Hong Kong	5.7	12516	25.3	73.3	96.4	92.8	4.6
Hungary	1.4	8151	18.4	82.2	26.1	28.5	4.1
Iceland	1.9	18017	23.7	98.6	2.4	21.1	1.9
India	5.7	1162	11.9	41.7	4.4	4.3	0.6
Indonesia	4.6	1891	16.8	44.4	8.7	12.6	1.9
Iran	2.5	3982	19.8	57.9	1.1	9.5	0.0
Ireland	8.2	9978	19.7	102.5	39.9	34.6	3.0
Israel	2.4	11394	25.0	84.3	20.1	26.0	3.4
Italy	2.2	15161	21.8	83.0	15.7	10.8	2.0
Jamaica	0.3	3470	15.4	66.8	15.2	25.0	16.4

Japan	2.9	15631	31.6	97.7	9.7	3.0	0.1
Jordan	-0.2	4051	15.6	58.9	9.6	32.2	10.3
Kenya	0.1	1231	8.3	24.1	3.5	16.8	4.5
Korea, Republic of	11.4	4830	34.0	91.7	27.4	17.9	1.1
Madagascar	-1.2	1087	2.8	18.9	2.1	10.2	1.1
Malawi	1.0	648	9.2	11.6	1.3	21.7	0.7
Malaysia	5.1	4905	24.4	57.5	39.4	49.6	3.1
Mali	0.1	948	7.8	8.2	0.3	14.6	1.3
Mauritius	7.1	5768	12.0	56.5	23.7	36.0	8.2
Mexico	0.8	7603	18.1	58.7	10.8	14.6	1.9
Morocco	1.2	2976	12.7	35.5	8.3	14.9	4.3
Mozambique	-0.4	1129	3.1	7.3	1.0	16.6	1.5
Nepal	3.5	863	15.5	33.3	5.2	12.8	3.1
Netherlands	2.5	16164	22.1	118.6	28.3	30.2	1.5
New Zealand	1.6	14304	21.2	95.0	5.6	17.8	2.6
Nicaragua	-2.1	3066	12.1	42.9	3.0	30.7	1.8
Niger	-1.1	1111	6.0	6.0	4.1	11.5	0.4
Nigeria	-2.1	1209	8.3	30.0	0.3	20.3	0.1
Norway	3.1	16772	29.3	106.3	8.5	18.6	1.4
Pakistan	3.7	1159	11.3	20.7	9.2	10.2	0.4
Panama	0.7	5318	18.4	63.4	1.1	20.6	3.6
Paraguay	0.3	4449	12.8	36.3	1.3	15.1	1.6
Peru	-0.3	4866	18.0	65.4	2.2	10.5	1.0
Philippines	0.2	3275	15.0	71.6	13.4	18.7	1.7
Poland	1.6	7011	19.9	85.3	12.9	19.0	0.9
Portugal	3.8	9024	21.9	77.7	16.3	21.3	4.6
Romania	5.3	2077	21.9	88.0	16.3	17.5	0.8
Rwanda	-0.9	1104	4.3	8.6	0.1	13.7	0.4
Senegal	0.5	1465	6.5	14.9	5.8	15.3	3.2
South Africa	-0.2	7892	9.5	80.8	7.1	14.6	1.7
Spain	2.8	11520	23.4	104.9	10.2	11.5	4.5
Sri Lanka	4.3	1782	13.5	68.0	11.3	22.6	1.7
St. Lucia	4.8	3219	15.1	91.7	7.8	44.5	32.0
Sweden	1.9	17179	20.5	111.7	23.4	18.8	1.3
Switzerland	0.9	22320	26.3	99.6	25.8	24.0	3.2
Syria	1.9	2965	11.6	49.7	3.5	16.0	1.5
Thailand	7.4	2756	31.3	38.8	17.7	24.4	4.3
Togo	-1.8	1370	7.5	26.5	2.9	22.8	2.4
Trinidad &Tobago	0.9	9466	10.2	78.3	1.1	21.7	2.0
Tunisia	2.8	4354	14.4	49.2	10.0	28.1	8.0
Turkey	2.9	4325	16.9	47.2	17.0	11.2	2.7
Uganda	5.6	442	2.8	11.7	0.5	14.3	0.8
United Kingdom	2.7	14340	17.9	107.6	14.9	16.6	1.5
Uruguay	1.1	7944	11.6	76.8	5.4	10.4	3.1
USA	2.8	21337	20.6	95.8	5.2	6.9	0.8
Venezuela	-0.9	7905	14.4	35.0	2.3	12.9	0.8
Zambia	-1.4	1240	9.5	22.3	2.4	17.9	0.5
Zimbabwe	-0.3	2627	13.1	40.7	7.0	19.4	0.9
	G8000/20	Y80	I8000	S8000	MX8000	MM8000	T8000
	%	USD	%	%	%	%	%
Average	1.9	6283	15.3	56.8	9.4	18.9	3.1

Note. G8000/20 is the real growth rate of GDP per capita at PPP per annum between 1980 and 2000. Y80 is the GDP per capita in USD at PPP in the year 1980. I8000 is the investment share in GDP per capita at PPP, averaged 1980-2000. S8000 is the gross secondary school enrolment ratio, averaged 1980-2000. MX8000 is the share of manufactures exports in % of GDP, averaged 1980-2000. MM8000 is the share of manufactures imports in % of GDP, averaged 1980-2000. T8000 is the share of travel income in GDP, averaged 1980-2000.

Table E
Descriptive Statistics V

	N21S8000	N21T8000	N21MX8000	N21MM8000
	No.	No.	No.	No.
Average	18.4	19.0	17.5	17.5
Algeria	20	12	21	21
Argentina	19	21	21	21
Australia	20	21	21	21
Austria	21	21	21	21
Bangladesh	20	21	19	18
Barbados	17	21	21	21
Belize	18	17	20	20
Benin	18	21	13	13
Bolivia	20	21	21	21
Brazil	19	21	21	21
Burkina Faso	20	15	6	6
Burundi	19	12	12	12
Cameroon	18	16	14	14
Canada	20	21	21	21
Cape Verde	18	9	3	3
Chad	15	13	4	5
Chile	18	21	21	21
China	20	19	15	15
Colombia	20	21	21	21
Comoros	15	13	10	10
Congo, Republic of	18	18	10	10
Costa Rica	20	21	21	21
Cote d'Ivoire	20	21	11	11
Denmark	20	20	21	21
Dominican Republic	17	21	14	6
Ecuador	21	21	21	21
Egypt	20	21	20	20
El Salvador	17	21	21	21
Ethiopia	20	19	6	6
Finland	21	21	21	21
France	21	21	21	21
Gabon	2	20	9	10
Germany	10	21	21	21
Ghana	20	18	11	11
Greece	21	20	21	21
Grenada	2	21	20	20
Guatemala	19	21	21	21
Guinea-Bissau	17	2	5	5
Honduras	13	21	21	21
Hong Kong	15	3	21	21
Hungary	20	19	21	21
Iceland	21	21	21	21
India	20	21	21	20
Indonesia	19	20	21	21
Iran	20	21	8	8
Ireland	18	21	21	21
Israel	21	21	21	21
Italy	21	21	21	21
Jamaica	20	21	21	21

Japan	21	15	21	21
Jordan	9	21	20	20
Kenya	20	21	20	20
Korea, Republic of	20	21	21	21
Madagascar	13	21	17	17
Malawi	19	15	14	17
Malaysia	20	21	21	21
Mali	18	18	9	9
Mauritius	20	21	21	21
Mexico	21	21	21	21
Morocco	20	21	21	21
Mozambique	18	1	9	8
Nepal	20	21	21	21
Netherlands	21	21	21	21
New Zealand	20	21	21	21
Nicaragua	19	21	18	18
Niger	20	16	8	8
Nigeria	17	20	14	14
Norway	21	21	21	21
Pakistan	19	21	21	21
Panama	20	21	21	21
Paraguay	20	21	21	21
Peru	18	21	21	21
Philippines	19	21	21	21
Poland	19	21	11	11
Portugal	21	21	21	21
Romania	21	21	11	11
Rwanda	19	20	4	4
Senegal	20	20	18	18
South Africa	14	21	18	19
Spain	21	21	21	21
Sri Lanka	18	21	16	16
St. Lucia	3	21	20	20
Sweden	21	21	21	21
Switzerland	11	21	21	21
Syria	20	21	17	17
Thailand	19	21	21	21
Togo	20	21	16	16
Trinidad &Tobago	20	19	17	21
Tunisia	21	21	21	21
Turkey	19	14	21	21
Uganda	20	6	11	11
United Kingdom	21	21	21	21
Uruguay	18	21	21	21
USA	19	21	21	21
Venezuela	20	21	21	21
Zambia	20	13	8	7
Zimbabwe	19	15	17	16
	N21S8000	N21T8000	N21MX8000	N21MM8000
	No.	No.	No.	No.
Average	18.4	19.0	17.5	17.5

Note. N21S8000, N21T8000, N21MX8000 and N21MM8000 give the number of years that were available for calculating the respective variables.

Table F
Descriptive Statistics VI

	G8000/20	Y80	I8000	S8000	XGSY8000	MXXGS8000	TXGS8000
	%	USD	%	%	%	%	%
Average	1.9	6264	15.3	56.3	29.8	29.2	10.2
Algeria	0.2	4745	16.6	56.0	25.8	2.2	0.9
Argentina	0.2	10556	15.8	71.5	9.0	26.2	7.9
Australia	2.5	17092	23.2	102.4	17.4	17.9	7.8
Austria	2.5	15706	25.1	99.7	38.9	55.2	18.3
Bangladesh	3.7	967	10.4	22.5	8.8	58.0	1.2
Barbados	3.2	10024	11.4	92.1	57.5	18.1	51.6
Belgium	2.3	16303	22.1	112.9	69.7	67.8	2.9
Belize	2.0	4695	14.5	49.1	55.4	10.1	16.1
Benin	1.1	996	8.0	16.8	16.4	7.1	14.9
Bolivia	-0.5	3046	8.4	43.8	21.7	8.5	5.1
Brazil	0.7	6327	18.0	46.5	9.5	44.6	1.5
Burkina Faso	1.2	769	10.3	6.6	11.2	4.9	4.4
Burundi	-1.5	756	6.9	5.2	9.7	3.6	2.2
Cameroon	-0.2	2125	8.0	24.3	24.7	5.0	2.5
Canada	2.1	19022	24.1	100.4	31.6	52.3	3.7
Cape Verde	5.3	1963	17.6	23.6	17.0	7.9	14.5
Chad	-2.2	1622	6.3	8.2	15.1	12.4	3.6
Chile	4.2	5418	17.3	67.3	28.1	9.3	4.1
China	12.5	1072	19.2	50.3	16.2	75.3	4.6
Colombia	1.2	4314	11.8	52.7	15.9	19.9	6.6
Comoros	-1.2	2067	7.8	21.5	15.8	10.1	15.7
Congo, Republic of	0.8	1554	13.0	62.9	57.3	3.7	0.5
Costa Rica	0.4	5413	15.3	45.2	37.6	24.6	12.7
Cote d'Ivoire	-1.3	2498	5.7	21.1	37.1	10.6	1.8
Denmark	2.3	18282	21.3	112.4	35.7	46.1	5.9
Dominican Rep.	4.0	2916	13.3	47.4	27.1	44.8	35.0
Ecuador	-0.9	4191	16.5	55.3	28.2	3.9	5.3
Egypt	3.6	2419	7.4	69.1	21.9	11.8	14.2
El Salvador	0.3	4160	7.1	32.5	21.9	30.1	5.4
Ethiopia	0.0	641	4.2	13.4	10.4	3.9	2.1
Finland	2.7	15484	24.3	112.6	31.3	68.4	3.6
France	1.9	16201	23.8	98.9	22.4	64.4	7.4
Gabon	-0.3	9027	11.5	57.0	51.8	3.5	0.4
Gambia, The	-0.3	1284	7.9	20.1	50.1	2.3	25.5
Germany	2.2	15841	23.1	101.8	27.8	76.2	2.6
Ghana	0.6	1204	6.1	38.0	19.6	7.0	2.2
Greece	1.2	11767	21.1	92.1	20.1	25.3	18.9
Grenada	5.2	3039	20.7	62.8	45.9	4.9	49.4
Guatemala	-0.2	4053	7.4	23.9	17.2	21.1	6.1
Guinea	0.5	2584	10.1	12.6	24.1	21.8	0.9
Guinea-Bissau	2.6	453	18.7	10.2	12.5	3.5	6.3
Honduras	-0.5	2272	12.9	32.7	33.4	9.6	4.4
Hong Kong	5.7	12516	25.3	73.3	124.6	77.2	3.4
Hungary	1.4	8151	18.4	82.2	39.4	64.7	10.3
Iceland	1.9	18017	23.7	98.6	35.0	6.9	5.3
India	5.7	1162	11.9	41.7	8.5	50.1	7.8
Indonesia	4.6	1891	16.8	44.4	28.5	29.0	6.4
Iran	2.5	3982	19.8	57.9	15.7	5.8	0.5
Ireland	8.2	9978	19.7	102.5	63.7	61.1	4.7
Israel	2.4	11394	25.0	84.3	36.0	56.4	9.6
Italy	2.2	15161	21.8	83.0	22.6	69.4	8.9

	G8000/20	Y80	I8000	S8000	XGSY8000	MXXGS8000	TXGS8000
Jamaica	0.3	3470	15.4	66.8	47.2	32.1	34.7
Japan	2.9	15631	31.6	97.7	11.2	86.9	0.5
Jordan	-0.2	4051	15.6	58.9	45.2	21.1	23.1
Kenya	0.1	1231	8.3	24.1	27.6	12.1	15.9
Korea, Republic of	11.4	4830	34.0	91.7	34.3	80.3	3.2
Madagascar	-1.2	1087	2.8	18.9	17.5	11.3	5.2
Malawi	1.0	648	9.2	11.6	24.4	5.1	2.9
Malaysia	5.1	4905	24.4	57.5	76.7	46.2	3.9
Mali	0.1	948	7.8	8.2	18.5	2.0	6.5
Mauritius	7.1	5768	12.0	56.5	57.6	40.1	14.3
Mexico	0.8	7603	18.1	58.7	20.6	46.2	9.8
Morocco	1.2	2976	12.7	35.5	24.8	32.5	17.1
Mozambique	-0.4	1129	3.1	7.3	9.5	10.3	15.5
Nepal	3.5	863	15.5	33.3	16.0	31.1	19.9
Netherlands	2.5	16164	22.1	118.6	56.2	50.1	2.7
New Zealand	1.6	14304	21.2	95.0	29.4	19.0	8.6
Nicaragua	-2.1	3066	12.1	42.9	22.9	10.9	5.6
Niger	-1.1	1111	6.0	6.0	18.6	19.6	2.3
Nigeria	-2.1	1209	8.3	30.0	32.7	0.7	0.9
Norway	3.1	16772	29.3	106.3	39.7	21.6	3.5
Pakistan	3.7	1159	11.3	20.7	14.3	63.0	2.8
Panama	0.7	5318	18.4	63.4	38.4	3.1	9.9
Paraguay	0.3	4449	12.8	36.3	25.7	5.0	7.9
Peru	-0.3	4866	18.0	65.4	15.4	14.8	7.5
Philippines	0.2	3275	15.0	71.6	32.6	34.0	5.2
Poland	1.6	7011	19.9	85.3	25.6	50.2	6.2
Portugal	3.8	9024	21.9	77.7	29.4	55.3	14.9
Romania	5.3	2077	21.9	88.0	25.3	64.5	4.0
Rwanda	-0.9	1104	4.3	8.6	8.2	0.5	5.3
Senegal	0.5	1465	6.5	14.9	29.2	19.0	11.2
South Africa	-0.2	7892	9.5	80.8	26.0	28.3	6.6
Spain	2.8	11520	23.4	104.9	20.6	49.1	21.5
Sri Lanka	4.3	1782	13.5	68.0	30.9	37.8	5.6
St. Lucia	4.8	3219	15.1	91.7	65.7	11.6	52.3
Sweden	1.9	17179	20.5	111.7	35.2	66.5	3.6
Switzerland	0.9	22320	26.3	99.6	36.9	70.1	8.8
Syria	1.9	2965	11.6	49.7	23.6	15.6	16.6
Thailand	7.4	2756	31.3	38.8	36.0	44.7	12.2
Togo	-1.8	1370	7.5	26.5	38.2	7.8	6.0
Tunisia	2.8	4354	14.4	49.2	43.5	22.4	42.5
Turkey	2.9	4325	16.9	47.2	39.9	41.8	49.7
Uganda	5.6	442	2.8	11.7	10.7	4.0	14.0
United Kingdom	2.7	14340	17.9	107.6	26.2	57.1	5.8
Uruguay	1.1	7944	11.6	76.8	20.8	25.7	15.1
USA	2.8	21337	20.6	95.8	9.6	53.3	8.0
Venezuela	-0.9	7905	14.4	35.0	26.8	8.2	2.9
Zambia	-1.4	1240	9.5	22.3	32.8	8.6	2.5
Zimbabwe	-0.3	2627	13.1	40.7	27.9	25.7	3.3
	G8000/20	Y80	I8000	S8000	XGSY8000	MXXGS8000	TXGS8000
	%	USD	%	%	%	%	%
Average	1.9	6264	15.3	56.3	29.8	29.2	10.2

Note. G8000/20 is the real growth rate of GDP per capita at PPP per annum between 1980 and 2000. Y80 is the GDP per capita in USD at PPP in the year 1980. I8000 is the investment share in GDP per capita at PPP, averaged 1980-2000. S8000 is the gross secondary school enrolment ratio, averaged 1980-2000. XGSY8000 is the share of exports of goods and services in % of GDP, averaged 1980-2000. MXXGS8000 is the share of manufactures exports in % of exports of goods and services, averaged 1980-2000. T8000 is the share of travel income in GDP, averaged 1980-2000.

Table G
Descriptive Statistics VII

	N21S8000	N21XGSY8000	N21MXXGS8000	N21TXGS8000
	No.	No.	No.	No.
Average	18.4	20.6	17.3	19.2
Algeria	20	21	21	12
Argentina	19	21	21	21
Australia	20	21	21	21
Austria	21	21	21	21
Bangladesh	20	21	19	21
Barbados	17	21	21	21
Belgium	17	21	21	21
Belize	18	21	20	21
Benin	18	21	13	21
Bolivia	20	21	21	21
Brazil	19	21	21	21
Burkina Faso	20	21	6	15
Burundi	19	21	12	12
Cameroon	18	21	14	16
Canada	20	21	21	21
Cape Verde	18	15	3	15
Chad	15	21	4	15
Chile	18	21	21	21
China	20	21	15	19
Colombia	20	21	21	21
Comoros	15	21	10	16
Congo, Republic of	18	21	10	18
Costa Rica	20	21	21	21
Cote d'Ivoire	20	21	11	21
Denmark	20	21	21	21
Dominican Republic	17	21	14	21
Ecuador	21	21	21	21
Egypt	20	21	20	21
El Salvador	17	21	21	21
Ethiopia	20	20	6	20
Finland	21	21	21	21
France	21	21	21	21
Gabon	2	21	9	20
Gambia, The	20	21	9	18
Germany	10	21	21	21
Ghana	20	21	11	21
Greece	21	21	21	20
Grenada	2	21	20	21
Guatemala	19	21	21	21
Guinea	18	15	6	15
Guinea-Bissau	17	21	5	6
Honduras	13	21	21	21
Hong Kong	15	21	21	3
Hungary	20	21	21	19
Iceland	21	21	21	21
India	20	21	21	21
Indonesia	19	21	21	20
Iran	20	21	8	19
Ireland	18	21	21	21

Israel	21	21	21	21
Italy	21	21	21	21
Jamaica	20	21	21	21
Japan	21	21	21	21
Jordan	9	21	20	21
Kenya	20	21	20	21
Korea, Republic of	20	21	21	21
Madagascar	13	21	17	21
Malawi	19	21	14	15
Malaysia	20	21	21	21
Mali	18	21	9	21
Mauritius	20	21	21	21
Mexico	21	21	21	21
Morocco	20	21	21	21
Mozambique	18	21	9	2
Nepal	20	21	21	21
Netherlands	21	21	21	21
New Zealand	20	21	21	21
Nicaragua	19	19	18	19
Niger	20	21	8	16
Nigeria	17	21	14	20
Norway	21	21	21	21
Pakistan	19	21	21	21
Panama	20	21	21	21
Paraguay	20	21	21	21
Peru	18	21	21	21
Philippines	19	21	21	21
Poland	19	11	11	11
Portugal	21	21	21	21
Romania	21	11	11	11
Rwanda	19	21	4	21
Senegal	20	21	18	20
South Africa	14	21	18	21
Spain	21	21	21	21
Sri Lanka	18	21	16	21
St. Lucia	3	21	20	21
Sweden	21	21	21	21
Switzerland	11	21	21	21
Syria	20	21	17	21
Thailand	19	21	21	21
Togo	20	21	16	21
Tunisia	21	21	21	21
Turkey	19	21	21	21
Uganda	20	21	11	10
United Kingdom	21	21	21	21
Uruguay	18	21	21	21
USA	19	21	21	21
Venezuela	20	21	21	21
Zambia	20	21	8	16
Zimbabwe	19	21	17	15
	N21S8000	N21XGSY8000	N21MXXGS8000	N21TXGS8000
	No.	No.	No.	No.
Average	18.4	20.6	17.3	19.2

Note. N21S8000, N21XGSY8000, N21MXXGS8000 and N21TXGS8000 give the number of years that were available for calculating the respective variables.